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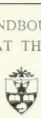
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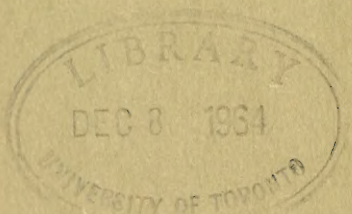

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CONTENTS.

Original Communications—

1. Lt.-Col. H. Herbert, F.R.C.S.—Operations for Filtering Cicatrices . 482
2. Alexander Garrow, M.D.—On the Treatment of Squint in Adults without Operation 485
3. Ernest Thomson, M.D.—Is Calmette's Ophthalmo-Reaction free from Danger? 489

Novelties—

1. T. Harrison Butler, M.D.—An Improved Spectacle Diagram ... 495

Review—

1. The Present Position of Vaccine and Serum Diagnosis and Treatment in Eye Disease.—By Percival J. Hay, M.D. ... 496

Translation—

1. Professor L. Bach.—The General Pathology of the Pupil 513

Current Literature—

I. The Venous Connections of Schlemm's Canal 519
II. Lagrange's Operation for Glaucoma 522
III. Male Fern Amaurosis 526
IV. Juvenile Tabes Dorsalis 527
V. The Municipal Treatment of Ophthalmia Neonatorum 529
VI. Oxycephaly 530
VII. Transferred Ophthalmitis 531
VIII. Education of the Cultured Blind 533
IX. Family Degeneration of the Retina with Idiocy 534
X. The Ocular Typhoid Reaction 536
XI. Tenonitis 538
XII. Lipæmia Retinalis 538
XIII. Interstitial Keratitis due to Acquired Syphilis 539
XIV. The Electro-diagnosis of Oculo-Motor Paralysis 540
XV. The Light-Sense in Strabismus 540
XVI. The Cornea in Multiple Sclerosis 541
XVII. Infections of the Choroid 542
XVIII. Injuries of the Eye from Lightning 543
XIX. Treatment 544
XX. Miscellaneous 551

Reviews 556

Notes and Echoes 559

ORIGINAL COMMUNICATIONS.

OPERATIONS FOR FILTERING CICATRICES.

BY

Lt.-Col. H. HERBERT, F.R.C.S.

LATE INDIAN MEDICAL SERVICE.

AN imperfect review only is possible at present of the methods which have been adopted for the relief of glaucoma by the formation of permeable scars. The more promising procedures are those quite recently introduced, and therefore insufficiently tested and yet susceptible of modification.

The general failure of de Wecker's simple sclerotomy perhaps discouraged other efforts in the same direction for a time. And iridectomy is not commonly included in these operations. But it is now becoming recognised how very frequently the iridectomy operation succeeds in relieving tension by the formation of a pervious cicatrix, whether this be by the unintentional inclusion of iris in the wound or not. It is supposed that in eyes with well-marked tension, sufficient separation of the wound surfaces takes place to prevent firm union, and that the frequent failure of the operation in chronic simple glaucoma is due to the absence of this separation. My own experience is that after successful iridectomy it is the rule to find both filtration (shown chiefly by conjunctival œdema in the neighbourhood of the scar) and healing of iris in the wound; and that where impaction of iris is not recognisable, there is rarely either obvious filtration or relief of tension. These are points, however, which might be readily settled by anyone who has access to a large number of results.

It was perhaps only to be expected that the iris-prolapse operations performed, with various modifications, by Bader, myself, and Holth,* of Christiania, should not have been received with general favour. But there is no doubt that the frequent applicability and the real value of such operations, carefully performed, have not been sufficiently recognised; and many patients have been allowed to become blind in both eyes from unrelieved tension who might have had useful sight preserved permanently. The risk of late destructive inflammation of the eye arising through a small subconjunctival prolapse or incarceration appears, from one's Bombay experience, to be extremely small. This risk is, of course, infinitely preferable to the progressive loss of sight from unrelieved tension in cases where iridectomy has failed, and where the remote danger of sympathetic ophthalmitis need not be considered owing to the fellow eye being already useless. In

* For description see THE OPHTHALMOSCOPE, 1907, p. 377.

India, when the patients could not be kept under observation, the prolapse operations appeared preferable to simple iridectomy whenever both eyes of the patient were glaucomatous. For adequate permanent reduction of tension could always be thus assured, although permanent reduction was not always obtained immediately; and the diminution was never excessive.

Much of the disfavour with which the subconjunctival prolapse operations is regarded is ascribable to the very ugly "cystoid" and staphylomatous scars which have frequently been produced. But one may be sure of obtaining a flat or nearly flat scar by a method which I borrowed from a well-known London surgeon. After the performance of a small iridectomy, the iris, drawn out by the forceps at one end of the wound, is pulled down slowly and stretched from the angle of the wound until it tears. The loop of iris is thus drawn into a narrow inelastic thread, which may be cut short outside the wound, and which is sufficient to provide for permanent leakage of aqueous, although insufficient to give rise to a marked prominence.

At present, however, interest centres in iris-free filtering cicatrices. These have been formed certainly by two methods, and, possibly, by two additional ones. But it remains yet to be seen with what degree of regularity both excess and defect may be avoided in the result. F. Lagrange's operation*, now well-known, has had the longest trial. There are two faults in the operation as at present performed which might be easily remedied, namely: first, the incision might with advantage be reduced in length; and, secondly, a small basal iridectomy substituted for the large excision of iris now made. More important, however, is the want of some means of regulating the size, and particularly the depth, of the strip of sclerotic excised. Although Lagrange depicts unobjectionable filtering cicatrices among his results, other decided fistulæ have been produced. He seems to have been fairly secure against incomplete reduction of tension, but he fails to state whether the tension has not sometimes been lowered much below normal.

In my wedge-isolation operation, the original account of which was published in THE OPHTHALMOSCOPE for June, 1907, the same difficulty has to be met. At the Sheffield meeting of the British Medical Association, to be held later in the present month, I hope to show some perfect filtering scars. But I have not entirely escaped an experience of both excessive (fistulous) and deficient reduction of tension. This want of uniformity in results is attributable to easily recognizable and more or less intentional variations in the shape and position of the strip of sclero-corneal tissue isolated. But it remains to be demonstrated that considerable variation from the desired result

* For description see THE OPHTHALMOSCOPE, September, 1907.

can be surely avoided by reasonable care and by attention to detail in operating. I have waited to learn more regarding the precautions required to secure uniform results before altering the necessarily involved descriptions of the operative *technique* already published.

It is not true that, as Lagrange supposes (*see* THE OPHTHALMOSCOPE, VI, 1908, 363), sclerectomy is necessary for the formation of a permanently pervious iris-free cicatrix. A limited shrinkage of isolated tissue appears to be fully effective. It is even probable that the partial isolation of a small tongue of tissue may provide for the necessary shrinkage. I have some patients now under observation upon whom the modified subconjunctival paracentesis described in my paper, already referred to, has been performed. Filtration promises to be permanent.

Perhaps the most attractive of all of these operations is that of Bettremieux, described briefly in *La Clinique Ophtalmologique*, 25 août et 10 septembre, 1907.* If simple excision of the outer layers of sclerotic can be performed with sufficient precision to ensure leakage through a flat, even scar, this trivial operation, without opening of either chamber of the eye, must have a great future. But the method has been so little tested that it can be regarded at present as little more than a suggestion. Only six operations had been performed upon human eyes at the time of Bettremieux's report, and they were too recent to show the permanent results.

ON THE TREATMENT OF SQUINT IN ADULTS WITHOUT OPERATION.

BY

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THE two following cases of squint in adults are, I think, worthy of record, on account of the success which has attended their treatment without having resort to operation.

Case I.—Female, school teacher, now aged 18, consulted me first on 9th February, 1905, on account of her eyes, and headaches. I got the history that the left eye had squinted since she was aged 4, and that she had always been a sufferer from headaches.

* For abstract see THE OPHTHALMOSCOPE, May, 1908, p. 400.

I shall summarize what I found on examination as follows: V.R. $= \frac{6}{24}$ partly; V.L. $= \frac{3}{60}$. Ciliary spasm was evidenced by improvement of the right vision to $\frac{6}{18}$ by a —3D. Sph. Under atropine, the retinoscopy was :—

$$\text{R.} = \frac{+2{\cdot}75\text{D.}}{+5\text{D.}} \qquad \text{L.} = \frac{+2{\cdot}75\text{D.}}{+7\text{D.}}$$

Media clear. Both fundi congested.

There was a constant internal squint of the left eye. The angle of squint was not measured, but the eyeball was so deviated inwards that no sclerotic was visible at the inner canthus. Fig. 1 is an enlargement from a school group taken about seven

Fig. 1.

years ago. The side face position, which has been adopted with the evident desire to hide the squinting eye, has actually magnified the appearance of squint, but in 1905 her full face appearance was almost as bad. I prescribed the following corrections :

R. +3D. sph. with +2·25 cyl. axis vert., and
L. +3D. sph. with +4·25 cyl. axis vert.

with which vision was R. $\frac{6}{24}$ easily and L. $\frac{6}{36}$.

Atropine was prescribed for the *fixing* eye and the eye was kept fully under it for about four months. The vision of the

eyes did not change during this time, nor did the squint. In June, 1905, I began exercises with Worth's amblyoscope, and continued them twice or three times a week for six weeks, by which time the squint had disappeared, as is shown by the

Fig. 2.

photograph (fig. 2), taken $2\frac{1}{2}$ years after the cure had been effected.

The patient had at first very great difficulty in fusing the pictures with the amblyoscope until I hit upon the following suggestion.—I told her to relax her accommodation and ignore the pictures she was trying to fuse, but to look beyond, as if she were looking through the instrument at the opposite wall of the room. She did this, and kept moving the arms of the instrument until she got a glimpse of a fused picture, and for the first time saw what she was aiming to see, after which her progress was rapid.

Fig. 2 is rather spoiled by the fact that she is wearing badly-fitting frames. She is now a governess on a distant farm, and, having broken the frames, she fitted the glasses into another frame found on the farm. I may add that she has had complete relief from the headaches, although it is interesting to know that when I saw her during her last Christmas holidays she said that lately her headaches had recurred. Enquiry elicited the fact

that this dated from the time of wearing the narrow frames, and when the mal-position of the lenses is put right by correctly fitted frames the headaches will doubtless again disappear.

The corrected vision in 1905, before treatment, was R. $\frac{6}{24}$ and L. $\frac{6}{36}$, while on 24th December, 1907, it was R. $\frac{6}{6}$ and L. $\frac{6}{12}$ partly.

Case II.—Female, housewife, aged now about 28, first consulted me on 17th December, 1906, on account of the same condition as Case I.

V.R. = $\frac{6}{9}$ with difficulty. V.L. = $\frac{5}{36}$.

Under atropine, retinoscopy was

$$+3\text{D}.$$

$$\text{R.} \quad +4\text{D}. \quad \text{L.} \quad -- -5.5\text{D}.$$

Media clear. Fundi normal.

There was constant convergent squint of the left eye, as shown in the photograph (Fig. 3). It had developed when she was four or five years old.

Fig. 3

Glasses were prescribed and worn continuously from January, 1906. What has been said with regard to the treatment by atropine and the amblyoscope in Case I, applies in practically every detail to this case, except that the treatment had to be

Fig. 4.

more prolonged, on account of a tendency to recurrence of the squint when treatment was stopped. She was finally discharged from treatment, cured in November, 1906, and the photograph,

shown as Fig. 4, was taken some six months afterwards, and now, 15 months afterwards, the correct position of the eyes is being maintained.

Her corrected vision before treatment was R. $= \frac{6}{9}$ with difficulty L. $= \frac{6}{36}$, and on 11th September, 1907, it was R. $= \frac{6}{9}$ L. $= \frac{6}{9}$.

Remarks.—Three therapeutic measures were employed in the treatment of the above two cases: (1) correction of refraction; (2) instillation of atropine into the good eye; and (3) exercises with the amblyoscope. The first measure alone will cure some squints, and the first two measures combined have been employed with success. In my cases improvement seemed to set in so quickly after successful use of the amblyoscope that I was forced to think that the amblyoscopic exercises formed an important part of the treatment. The lesson I would draw from these cases is that even adults should be given a good trial by the above methods before proceeding to operation, if there is still some vision in the squinting eye.

IS CALMETTE'S OPHTHALMO-REACTION FREE FROM DANGER?

BY

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So much attention has been paid during the past year to the so-called Calmette ophthalmo-reaction in the diagnosis of tuberculosis that the time has arrived, not, indeed, for a critical review of the whole situation, but for consideration of the various "unfortunate" results which, *pace* the statements of some medical writers and of advertising drug vendors that the "test" is quite safe, have undoubtedly occurred in a certain number of cases.

Leaving on one side the questions of tuberculin reactions in general, and of the priority of this or that observer in the matter of the ophthalmo-reaction in particular, it will suffice to say, by way of introduction, that Calmette[1] in June, 1907, stated that if one drop of 1 per cent. aqueous solution of tuberculin be placed in the conjunctival sac of a patient suffering from active tuberculous trouble, congestion of the conjunctiva would occur in from three to five hours afterwards, and would be followed by muco-fibrinous secretion in from six to ten hours; there would be no pain and no effect on the temperature.

It is safe to say that in the course of the year since Calmette wrote, the test has been applied to many thousands of eyes, and that, on the whole, it has been found trustworthy, except under certain circumstances which do not come within the scope of this article. The question with which the present writer is concerned is whether the application of a solution of tuberculin to the conjunctiva for purposes of diagnosis is ever productive of more than the harmless local reaction described by Calmette. This question may be sub-divided for convenience into three headings: (1) Is there ever any constitutional reaction? (2) Is there ever any harmful action upon eyes which are not, or have not always been, quite healthy? and (3) Is there ever any harmful action upon absolutely normal eyes?

Constitutional reaction.—As to the first point, while Comby[26] saw no general reaction in 300 cases in children, Woodcock[5] states that he has twice seen a rise of temperature after the Calmette test, in one case from normal to 102° F. Many of his cases suffered from headache, without rise of temperature. In Audeoud's series of cases in children[24] there was a slight rise of temperature, never attaining 1° C. In Knapp's case[20], referred to further on, there was distinct constitutional reaction. Eyre, Wedd, and Hertz[4] remark that the instillation of tuberculin causes movements of the tuberculo-opsonin index similar to those which follow a subcutaneous injection, but as the permeability of the conjunctiva differs in different individuals there is no means of judging the exact dose administered in any given case. "As a note of warning it will suffice to say that the 'negative phase' is usually well-marked and sometimes lengthy." Two very suggestive cases have been recorded by Napier[2] which tend to confirm the opinion that the effect of the test may be something more than merely local and evanescent. In these patients a Calmette test (negative in one case, positive in the other) was followed up by subcutaneous therapeutic medication with tuberculin. In the negative case, thirteen days, and in the positive case, twenty-one days, after the application of the test, a severe conjunctivitis came on *in that eye only which had received the tuberculin.* From this, Napier concludes "that the instillation of tuberculin, even when it gives rise to no apparent reaction, brings about a local change of some kind which responds sharply to the introduction of a moderate dose of tuberculin into the circulation; it, in fact, causes the conjunctiva to react locally exactly as a latent tubercular focus would react." It has also been noted by Cohn[3] that a subcutaneous injection of tuberculin two or three weeks subsequently to an ophthalmic test often induces the conjunctival redness to reappear.

One must admit that the test has now been applied many thousands of times by observers in all parts of the civilised world, and that the proportion of reports in which any such constitutional reactions appear is very small. Calmette

himself[6] at the *Académie de Médecine* in January, 1908, stated distinctly that the test as prepared by him is absolutely harmless, provided the ordinary precautions of cleanliness are taken, and a number of writers affirm that they have never seen any untoward results. For instance, Campbell, McKee, and White[7], who tested 156 individuals, say that in no case could they be certain that the test caused a constitutional reaction as reported by writers. Yet one cannot resist the feeling that with a certain amount of positive evidence to show that in some cases there *is* a constitutional reaction, the latter would probably be found more often if carefully looked for.

But if there be ground for doubt whether the test causes any reaction other than the purely local one, it is quite evident that the local reaction is not always slight and harmless, even in sound eyes. Yet writers differ very greatly on this subject. Truc and Maillet[8], in reporting an investigation of 23 cases, absolutely contradict the statement made by Comby[9], namely, "Every eye lesion, acute or chronic, contraindicates the ophthalmo-reaction. I will even say that it is not sufficient that one eye be healthy; both must be so. If one eye is affected, the ophthalmo-reaction will risk bringing upon the sound eye the disease of its fellow besides which one cannot readily estimate by comparison the quality of the reaction." "Even with weak solutions of tuberculin (*e.g.*, 1 in 200) an intense local reaction sometimes takes place."

Local reaction on diseased eyes.—A number of reported mishaps prove that the application of tuberculin to eyes which are not absolutely normal is distinctly risky. Kalt[10] used 1 per cent. tuberculin from the Pasteur Institute in an eye which had suffered from sclero-keratitis, but which, at the time, was quiet and useful. The test lighted up the whole process afresh, and resulted in extensive sclerosis of the cornea, a most unfortunate result, since the fellow eye was glaucomatous.

Brons[11], who appears to have used a too concentrated solution of tuberculin, had five intense reactions out of 24 cases. In three of these he saw little opaque, gelatinous, nodular infiltrations in the œdematous conjunctiva, although in none was there any permanent effect on vision. Brons considers that it is inadvisable to instil tuberculin into abnormal eyes, without good reason for doing it.

Ramsay[12] utters a warning against the indiscriminate use of the test. One drop of 1 per cent. solution of tuberculin was instilled into an eye which was free of inflammation, although the cornea was nebulous: the other eye was suffering from an attack of superficial vascular ulceration. Within 24 hours there was violent muco-purulent inflammation of the tested eye; the cornea became vascular and centrally abraded. Improvement was very slow in spite of treatment by old tuberculin subcutaneously, and eventually, as the result of the Calmette instillation, there was considerable reduction of vision from corneal damage.

Barbier[13] reports a case (a boy of 13 years, who, in addition to recent internal tuberculous lesions had had keratitis in 1906) in which, as the result of the instillation of 1 per cent. tuberculin in one eye, both eyes suffered from severe keratitis.

Woodcock[14] who applied the test in 200 cases, says that patients with coincident disease of the eye or lids reacted violently, and complained, besides, of the pain and inability to use the eye.

Cates and Tubby[15] report a case in which, although on admission the patient's eyes appeared healthy, there had been some lacrymal trouble. As the result of one drop of Calmette serum, made by the firm of Meister, Lucius, & Brüning, there was severe conjunctival inflammation, and, ultimately, a patch of keratitis, which ulcerated. *Staphylococcus albus* was cultivated from the discharge.

From the cases quoted it is fairly evident that there is a certain amount of risk in using tuberculin in an eye which is at the time, or has been in the past, inflamed in any way. Nor is there anything surprising in this, for one is daily accustomed to observe the effect of traumatism or unfavourable local or general conditions in lighting up old inflammations of the eye, or in aggravating existing troubles

Local reaction on healthy eyes.—But what of the possible harmful action of tuberculin on eyes which are apparently normal? Reaction varying from a trifling conjunctival congestion, on the one hand, to a catarrh lasting a week or ten days, on the other, may be considered as quite usual.

Eyre, Wedd, and Hertz (*loc. cit.*) in 138 individuals saw nothing worse than "inconvenience caused by swelling and lacrymation." Again, Eisen[16] in 82 cases saw only once the conjunctivitis last as long as six days.

Yet, in spite of such statements made by writers, there is a number of cases on record in which damage of some sort has resulted. Walker[17] has seen phlyctenular corneal ulcer as the result of the test, and he refers to a similar case by Webster and Kilpatrick.

Heywood[18] at a meeting of the Clinical Society of Manchester said he considered 0·50 per cent. solution was strong enough for children. In one case the conjunctivitis had lasted six weeks and was only slowly getting well at the time of speaking.

Rénon[19] observed accidents, plainly due to the employment of the test, in patients with sound eyes, three times out of twenty-eight. In one case intense conjunctivitis lasted forty-five days; in another there was slight keratitis; and in a third, twenty days after the reaction, there was extensive interstitial keratitis with iritis, lasting more than three weeks. The strength of the tuberculin appears to have been 1 per cent.

Knapp's case[20], which might possibly be considered as coming under the second heading (inasmuch as one eye was

inflamed) merits careful consideration. A girl of nine years, whose right eye presented superficial corneal infiltration, but whose general health was good, and left eye normal, received in her left eye one drop of 1 per cent. tuberculin solution, obtained from the New York Board of Health laboratories. Six hours later, redness and swelling of the lids, together with pain. This was followed by thin muco-fibrinous discharge, which showed no micro-organisms. There was marked general reaction: temperature rose to 100·4° F. About ten days later, corneal infiltrations appeared, coalesced, and became vascular and progressive. The author says:—"This is a typical tuberculous process in the cornea and as it came on after the use of the tuberculin solution in a previously healthy eye, a connection seems very probable. This unfortunate case demonstrates that the ophthalmo-reaction cannot be regarded as harmless."

To the present reviewer this case of Knapp's seems to bear out Comby's contention, quoted earlier in this article, namely, that before applying tuberculin to an eye it is necessary to know that *both eyes* are sound.

Mackay [21] tells of a patient who wished to have a diagnosis of tuberculosis confirmed or negatived by an expert. One per cent. tuberculin instilled into her previously healthy eye resulted in a conjunctivitis which, including a recrudescence, lasted for ten weeks, at the end of which time, indeed, it had not entirely subsided. The tested eye alone was affected.

Cates and Tubby (*loc. cit.*) describe how a healthy eye reacted violently, and suffered exacerbations every four or five days. The exact duration is not stated, but, inferentially, was about two months. Staphylococcus albus was found in the discharge from this eye, as well as from the eye of the other patient mentioned by Cates.

de Lapersonne [25], in a paper to which the reviewer has not had access, records several cases in which severe conjunctivitis and keratitis persisted for weeks after the instillation of tuberculin.

In accordance with the statement in the opening paragraph of this memorandum, the writer does not intend to attempt a summary of the facts as to the ophthalmo-reaction in general. It may be sufficient to suggest that there must be sources of error somewhere to account for the differences in the statements made by various observers, differences apparently so unreconcilable (contrast *e.g.* 22, 23, with many other authors) that it is almost unreasonable to suppose that the observations have been carried out under really similar conditions. Time must yet be allowed for the discovery of these sources of error before a final verdict can be passed upon the value of the reaction. Undoubtedly, however, a single eye damaged, to say nothing of a considerable number of such accidents, even although the proportion borne to the total cases be very small, is sufficient to make one hesitate to affirm that the Calmette test

is free from danger. It is, after all, scarcely twelve months since its introduction, and there is still plenty of time for further evidence to be brought forward.

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NOVELTIES.

AN IMPROVED SPECTACLE DIAGRAM.

BY

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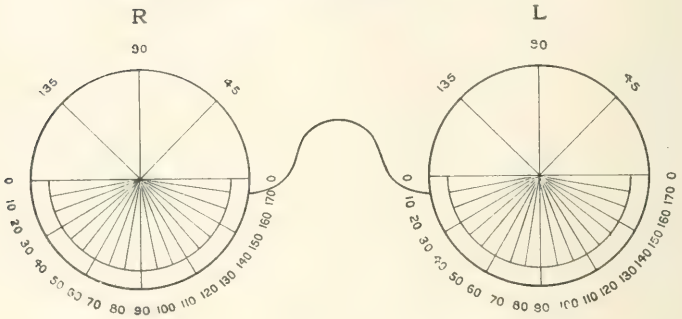

	Right.		Left.	
	Sph.	Cyl.	Sph.	Cyl.
Far				
Near				

In designing the diagram illustrated I have tried to keep all the most frequently employed axes as separate as possible.

The half right angles, 45° and 135°, are in the upper semi-circle. The thirds of a right angle are indicated on the outer circle of the lower semi-circle. The less frequently used angles are only marked on the inner circle.

I have employed the standard notation which is now used by all firms of lens grinders.

I have adopted the circular form, for I have found that the axis from a retinoscopy can be more accurately laid off upon a circle than an oval; and the former is certainly more scientific.

A block can be obtained from Messrs. Iliffe & Sons, Coventry, price 3s.

REVIEW.

THE PRESENT POSITION OF VACCINE AND SERUM DIAGNOSIS AND TREATMENT IN EYE DISEASE.

BY

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Vaccine and serum diagnosis and treatment form a branch of medicine full of many difficulties, while offering problems of the most vivid interest. Slowly, but surely, we are gaining a wider knowledge and a clearer conception of the intricate bio-chemical processes upon which they depend, and every now and then there is some practical outcome of the long and painstaking researches —a new vaccine, a new serum, a new method of applying an old serum, or a new mode of registering its effects, etc.

The object of the present paper is to review the work of the last year or two, as far as it concerns the ophthalmic surgeon. Questions of practical interest will receive first consideration, but, wherever possible, attention will be paid to theoretical matters.

Vaccines.

There seems to be a certain confusion in the minds of some writers as to what is meant by a vaccine. A vaccine may be defined as a preparation of living or dead bacteria, or their products. Small pox vaccine, staphylococcic and streptococcic vaccine, tuberculin (tubercle vaccine), etc., may be cited as examples.

Vaccine Diagnosis.

Vaccine diagnosis is practically limited to tuberculosis. The first method introduced for this disease was that of the hypodermic injection of tuberculin proposed by Koch. During the last year a number of new methods have been added, chief among which are the following:—

(1) Scarification, introduced into practice by v. Pirquet.
(2) Ophthalmic instillation " " " Calmette.
(3) Inunction " " " Moro.
(4) Inoculation of blister " " " Woodcock.

Before discussing these later methods, it may be as well to refer briefly to Koch's method —one which is not much used in this country, although it is extensively employed abroad.

Koch's Method.

The tuberculin used for this as well as for the newer methods of diagnosis is Koch's "old tuberculin," an emulsion of tubercle

bacilli in glycerine. From this the following solution is freshly prepared :—

Old tuberculin	1.0 c.c.
Ac. carbol.	0.5 c.c.
Aq. dest.	100 c.c.

$\frac{1}{1}$ cc. of this solution contains 1 mg. of old tuberculin.

The patient is first examined carefully for any signs of active tuberculous disease, and the temperature taken every two hours for two days. Active tuberculosis forms a contra-indication to the application of this method of diagnosis.

If there are no signs of active disease of a tuberculous nature, 1 mg. of old tuberculin is injected at 11 a.m. (Axenfeld). The test is regarded as positive if the injection is followed by a general reaction, characterized by a rise in temperature—at least up to 99·5°F.—accompanied by malaise and headache. The rise of temperature generally occurs early in the morning next day. If it is only slight another injection of 1 mg. is given in 48 hours. If no reaction follows the first or the second injection, 5 mg. are injected after 48 hours. If no reaction follows this dose (some give another of 10 mg.), the test is considered to be negative. The injections may also produce a local reaction in the shape of hyperæmia, increased exudation, etc., at the seat of disease, and some authors regard this reaction as essential for a positive diagnosis of a tuberculous affection of the eye.

Carried out in this way, no danger is attached to this method of diagnosis, while its diagnostic value is so great that many regard it as a standard by which all other methods should be judged. Among patients undoubtedly affected with tuberculous disease, Beck[1] and Fraenkel[2] found the reaction positive in all cases. Where tuberculosis was suspected, Fraenkel obtained a positive reaction in 92·1%, and Beck in 85·2%. Where there were no clinical signs of tubercle, Fraenkel found the reaction positive in 56·1%, and Beck in 54%. The most important group of cases is, of course, that of the suspected or doubtful ones. It is here that we wish for a trustworthy aid to diagnosis. That a simple and reliable, as well as a safe test, is a desideratum felt by many clinicians, is shown by the feverish haste with which numerous contributions on the newer methods have been penned.

Among recent statistics on tuberculin injections for ophthalmic diagnosis we may mention those of Schumacher[3]. First, with regard to cases which clinically were certainly tuberculous, seven out of seven cases of parenchymatous keratitis gave a typical general reaction and six of them a local reaction ; four out of four cases of deep keratitis and cyclitis gave a general reaction, two a local reaction ; eleven out of nineteen cases of tuberculous cyclitis gave a local reaction. As regards cases clinically not tuberculous, four of syphilitic keratitis and one each of specific iritis, specific choroiditis, choroidal leuco-sarcoma, and trachomatous pannus, none reacted. Regarding doubtful cases, Schumacher mentions 24 in which the diagnosis lay between syphilitic and tuberculous

keratitis. Nine of these were patients affected with congenital syphilis as well as with tuberculosis. In all the 24 cases a positive general reaction, and in three a local reaction was obtained. 66 out of 76 cases of scrofulous disease were positive.

Comby,[4] during a period of ten years, gave subcutaneous injections to 74 children, 36 of whom showed a positive general reaction. A *post-mortem* examination was performed in twelve of the positive cases and all presented tuberculous lesions, while a *post-mortem* examination of six of the negative cases confirmed the absence of tubercle.

The disadvantages of the subcutaneous injections are the fever, headache, and malaise caused by them.

Pirquet's Method.

In June last year v. Pirquet[5] published results obtained by scarifying the skin and applying the vaccine to the scarified surface. For this purpose he employed a 25 per cent. solution of "old tuberculin" in carbol-glycerine. A 10 per cent. solution, however, is equally efficient for all practical purposes (Junker). It is better also to use 0·5 per cent. carbolic acid and 3 per cent. glycerin for diluting instead of carbol-glycerin. v. Pirquet's method is applied in the following manner:—two drops, one of the vaccine and one of physiological salt solution as a control, are dropped upon the skin about half an inch apart. The skin is then punctured through the two drops, care being taken to make the puncture superficial and not to draw any blood. A positive reaction is characterized by a red papule upon an infiltrated base surrounded by a sharply-defined zone of hyperæmia. The papule must remain at least five days, otherwise the reaction is considered to be negative. The swelling and hyperæmia generally commence within a few hours, sometimes only after 24 hours, and more rarely in two or three days. The hyperæmia is diffuse at first, but soon becomes circumscribed, though occasionally it takes two to three days to do so. Further particulars will be found in THE OPHTHALMOSCOPE (Stephenson[6], 1st December, 1907).

Pirquet's first paper contained a report upon 360 vaccinations in children. In 88 per cent. of the tuberculous cases he obtained a positive reaction. The remaining 12 per cent. were either cases of advanced phthisis or of miliary tubercle. In a later paper[7] he published a series of 100 *post-mortem* examinations of children in whom the test had been tried. Forty-seven showed tuberculous lesions, 30 of whom had given a positive reaction; the other 17 were cases of miliary tuberculosis and advanced phthisis. Fifty-three cases were found free from tuberculous infection: of these only one had given a positive reaction.

Pirquet's results have been confirmed by Pfaundler,[8] Dufour,[9] Arloing,[10] Abrami and Burnet,[11] Oppenheim,[12] Bandler,[13] Mainini,[14] Feer,[15] Goebel,[16] Stadelmann and Wolff-Eisner,[17] Junker,[18] Moro,[19] Emmerich,[20] and others.

Some of the earlier observers, Pirquet himself included, thought that the test was so delicate that it was unsuitable for adults, in whom it appeared to give a positive reaction in all cases, and thus apparently indicated not only the presence of active but also of latent or healed tubercle. This result seems to have been due to the circumstance that the earlier observers went too far in what they regarded as a positive reaction. Later investigators have found that a considerable percentage of persons clinically considered to be free from tubercle, do not react, *e.g.*, Goebel[16] found that 55 of his patients out of 85 did not react, Stadelmann[17] and Wolff-Eisner[17] 96 out of 192, similarly Junker, Moro, Emmerich, and others. Nevertheless, Pirquet's test is positive in a very large number of people who appear to be free from tubercle, and reveals, therefore, to a certain extent at least, latent tuberculosis. It will be seen from the accompanying tables that in suspected cases the percentage of positive reactions is about the same as with Koch's method. All things considered, Pirquet's test may be considered almost as accurate a diagnostic method as that of Koch, with the added advantage that it does not give rise to any constitutional disturbance. It causes only a slight itchiness at the site of inoculation.

Calmette's Method.

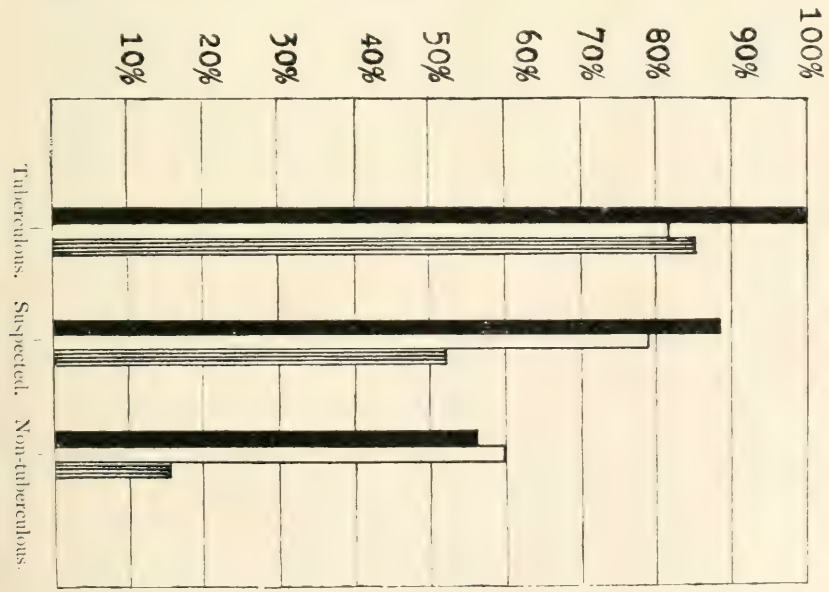
Shortly after Pirquet had published his first observations, his method was discussed at a meeting of the Berlin Medical Society (15th May, 1907) and here Wolff-Eisner mentioned incidentally that he had observed a reaction when tuberculin was instilled into the eye. Calmette[21] thereupon carried out a series of systematic observations on the subject, and published his results in the following month (19th June, 1907). He showed that the reaction, now generally known as "Calmette's ophthalmo-reaction," is typical and specific. A detailed paper on the subject by Sydney Stephenson[6] appeared in THE OPHTHALMOSCOPE a short time ago, so that I may be permitted to limit my Review to the work which has appeared since then.

Two questions have occupied the attention of almost everybody who has interested himself in the ophthalmo-reaction: (1) the reliability, and (2) the safety of the test. Is it as reliable as the subcutaneous injections of Koch or the vaccination method of v. Pirquet, more particularly with regard to doubtful or suspected cases[2]? It appears that in these cases the ophthalmo-reaction is positive in about 50 per cent., Pirquet's test in about 80 per cent, and Koch's test in about 90 per cent, so that there is a difference of 30 per cent. and 40 per cent. respectively between the ophthalmo-reaction and the tests of v. Pirquet and of Koch. This difference is attributed by some writers to latent tubercle, which, it is said, is not revealed by the former, whilst it is shown up by the latter. That the two cutaneous tests show up more cases of latent tubercle than Calmette's reaction, is evident from the tables concerning the patients clinically

supposed to be free from tuberculous disease. What proportion of these patients, however, are cases of active, latent, or healed tubercle we do not know, and shall not know until we have some *post-mortem* evidence on the subject. In the meantime, one can only say with reference to the suspected cases, that there is probably some reason for "suspecting" them, and that a positive Pirquet or Koch reaction would probably be more correctly interpreted as evidence in support of the suspicion of an active focus. Errors made in this way will be on the safe side; it is better to diagnose a case of active tubercle too many, than one too few.

		Total number of cases.	Positive reaction in.	Percentage.
Tuberculous cases	Koch*	—	—	100 %
	Pirquet	291	237	81·5
	Calmette	1419	1191	83·8
Suspected cases	Koch*	—	—	88·6 %
	Pirquet	281	208	79·0
	Calmette	516	268	51·9
Non-tuberculous cases	Koch*	—	—	55·5 %
	Pirquet	418	250	59·8 %
	Calmette	1320	204	15·4 %

The table is compiled from the cases published by Audéoud, Baldwin, Blümel-Clarus, Calmette, and other French authors, Citron, Cohn, Emmerich, Eppenstein, Franke Ratjen, Gaup, Junker, Köhler, Lenhartz, Métraux, Moro, Schenk-Seiffert, Schröder-Kaufmann, Stadelmann and Wolff-Eisner.



The tuberculin diagnosis of tuberculous disease. Tables showing the relative value of

Hypodermic injection	Koch's method
Scarification	Pirquet's method
Ophthalmic instillation	Calmette's method

* Fraenkel and Beck's statistics.

Is the method of Calmette a safe one for the eye? Some conflicting evidence upon this question has been published. While at first we had perhaps too many enthusiastic supporters who could see no danger, we meet now with too many critics who see danger everywhere. The occurrence or non-occurrence of serious complications depends upon a variety of causes. Absence of such complications may be due to the circumstance, that the patient is so ill, that he cannot react, or react only feebly, *e.g.* Schulz-Zehden[22] reported, that he had only seen two serious reactions among 150 cases of chronic and eczematous conjunctivitis, fascicular and parenchymatous keratitis, leucoma, staphyloma, etc., but it turned out that most of his patients were in the last stages of phthisis! Franke, [33] Stephenson,[6] and others, however, observed no dangerous reactions among a number of eye patients, who either showed no other signs of tuberculous disease or were not far advanced. The cases included episcleritis, iridocyclitis, choroiditis and parenchematous keratitis. Others have not been so fortunate. Brons [23], Waldstern [24], Trousseau [25], Maitland Ramsay [26], A. Knapp [27], Barbier [28], Rénoy [29], Brunetière [30], Klieneberger [31], Wiens and Günther [32], and others have noted interstitial keratitis, corneal ulceration, kerato-iritis, iritis, phlyctenular keratitis, etc. Some of these accidents happened in eyes which were quite healthy (Knapp, Rénoy, Wiens, and Günther). The cases number very few considering the thousands of patients who have been tested, but they show that the reaction is not altogether free from danger. The strength of the solution naturally affects the intensity of the reaction, *e.g.*, Wiens and Günther used 0.5 per cent. and 1 per cent. of the Höchst preparation of old tuberculin, which is ten times as strong as that of Calmette. It is not advisable to use anything stronger than 0.5—1 per cent. of Calmette's tuberculin, at least as a preliminary test. Diluted solutions of tuberculin do not keep, and therefore they should be freshly prepared, otherwise negative results may be obtained, when they should be positive. The instillation produces a local hypersensitiveness to tuberculin, so that in the case of a negative reaction, the same eye should not be used for a second trial.

With regard to contra-indications, one may not want to go as far as de Lapersonne,[34] who is of opinion that the test should not be tried for the purpose of diagnosing an ocular affection, but the following points are worth bearing in mind. Citron[35] considers the reaction should not be tried unnecessarily in scrofulous children, in persons exposed to conditions which easily cause inflammation, in districts where trachoma is prevalent, in patients who have been tested before, in patients under treatment with tuberculin, in cases where one eye is or has been diseased, and, finally, in cases were the diagnosis is clinically certain.

Moro's Method.

From vaccination to inunction was but a step. Inunction was first tried by Lignieres and Berger.[36] They were followed by Moro[19] with whose name the method has become more intimately associated. It consists in rubbing into the skin an ointment composed of equal parts of old tuberculin and lanolin. (In preparing the ointment the lanolin requires to be warmed to 20°—30°C. before the tuberculin is added.) A small quantity, the size of a pea, is rubbed in upon an area about 2 inches in diameter upon the chest or abdomen, and left uncovered for ten minutes. A positive reaction is characterized by a papular eruption which appears in a day or two and remains for a few days or a week or ten days.

It is too early yet to say anything definite about the value of the test. It does not cause any fever or headache, and is easily applied. It does not elicit a reaction so often in persons clinically free from tubercle, as the tests of Koch and Pirquet (Emmerich,[37] Heinemann[38]).

Woodcock's Method.

More recently, Woodcock[39] has described a method of inoculating blisters with pure tuberculin T.R. Two small blisters are applied to the back of the chest, and after they have risen a water-dressing is used for two days to lessen the hyperæmia. Then, to one surface pure tuberculin T.R. is applied and allowed to dry. In positive cases this surface appears rosy-red in 24 hours with a blush on its circumference ; whereas the untreated surface is comparatively pale.

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Vaccine Treatment.

It is only comparatively recently that vaccine treatment has been adopted as a means of combating disease in active progress. For more than a century it has remained a prophylactic measure against small-pox until Koch in 1889 proposed treating tuberculosis with tuberculin. More recently, Wright and others have recommended vaccine treatment for diseases other than tubercle.

Vaccine treatment, it is perhaps needless to point out, is a method of active immunisation. It is only applicable by itself to chronic or subacute diseases, because a certain length of time —on an average, a week or two—needs to elapse before the protective substances against the disease are produced in quantities sufficient to be of any use.

Tuberculin (tubercle vaccine) and its Modifications.

Koch's first preparation of tuberculin was not suitable for therapeutic purposes, and the lines of treatment adopted by Koch's enthusiastic followers were still less so. The inevitable happened—tuberculin treatment fell into disrepute. Nothing more was heard of it until v. Hippel proposed a new method in 1904 and published cases of tuberculous iritis, etc., which he had treated successfully during a period of ten years. v. Hippel's method has met with success in the hands of almost all who have tried it, and is now probably one of the best forms if not the best form, of tuberculin treatment.

v. Hippel's Tuberculin Treatment.

The tuberculin recommended for v. Hippel's tuberculin treatment is tuberculin T.R. (Tuberkelbazillenrückstand=tubercle bacilli remainder). It is prepared according to Koch's directions at the Höchst Farbwerke in the following way, as stated by Professor W. G. Ruppel,[1] the head of the laboratories there :— 1 g. of dried tubercle bacilli is ground to a powder and then dissolved in 100 c.c. of distilled water. This solution is placed in a centrifuge and an opalescent fluid (T.O.) separated from an insoluble remnant (T.R.I.) or deposit. The former is highly toxic and is not used in the preparation of T.R. T.R.I. is only

slightly toxic. It contains the substances necessary for immunisation and is used for preparing tuberculin T.R. It is dried and ground once more and centrifuged. The superjacent fluid is kept and the deposit treated again as before. This process is repeated until the whole of T.R.I. is dissolved. The several solutions prepared from T.R.I. are added together. They measure somewhat less than 100 c.c. A sample is taken to estimate the percentage of solids in the mixture. To the remainder a little glycerin and formalin are added with sufficient water to arrange for 1 c.c. to contain 0·002 grms. of solids. This is the preparation known as tuberculin T.R. (in Germany it is called new-tuberkulin T.R. I believe I am right in stating that what we call "Neu Tuberculin" is T.R. + T.O.). Therefore 100 c.c. tuberculin T.R. contain 1 grm. of dried tubercle bacilli.

1 c.c. „ „ contains 0·01 grm. „ „ „
(not of solids be it noted).

For the injections the tuberculin T.R. requires to be diluted. The solutions should be *freshly prepared* and *clear*. They do not keep longer than a fortnight. Therefore, one should not buy tuberculin ready diluted. To dilute the tuberculin, it is best to use an aqueous solution of 20 per cent. glycerin which has been boiled for twenty minutes and has been allowed to cool. The following solutions are used in practice:—

Solution (1) 0·02 c.c. tuberculin T.R. + 9 c.c. glycerin water.
(2) 0.2 c.c. „ „ + 9 c.c. „ „
(3) 1·0 c.c. „ „ + 9 c.c. „ „

$\frac{1}{10}$ c.c. of No. 1 solution contains $\frac{1}{500}$ mg. tuberculin T.R.
$\frac{1}{10}$ c.c. „ 2 „ „ $\frac{1}{50}$ mg. „ „
$\frac{1}{10}$ c.c. „ 3 „ „ $\frac{1}{10}$ mg. „ „

The initial dose is $\frac{1}{500}$ mg. An injection is given every second day and the dose increased each time by $\frac{1}{500}$ mg. On reaching $\frac{10}{500} = \frac{1}{50}$ mg., the dose is increased by $\frac{1}{50}$ mg. up to $\frac{1}{5}$ mg., and then by $\frac{1}{10}$ mg. up to 1 mg. v. Hippel does not advocate larger doses than 1 mg. The treatment of the patient must be continued until the patient is *quite cured*, *i.e.*, until all signs of active disease have disappeared from the cornea, iris, vitreous humour, etc. The course of treatment is controlled by the temperature, which should not rise above 100°F. If a higher temperature should follow an injection, the same dose or a smaller one must be given until it causes no rise of temperature. N.B.—In some cases the injections have a cumulative effect which also shows itself in the temperature, and idiosyncrasy may prevent the maximum dose of 1 mg. being attained. Advanced cases of tuberculosis in which the recuperative powers are low, do not yield to the treatment.

What are the results which have been obtained with this form of treatment? v. Hippel[2] himself reported a cure in 23 cases of tubercle of the iris and three cases of tuberculous conjunctivitis

At the Ophthalmological Congress in Heidelberg in 1905 successful results were communicated by Haab, Czermark, Uhthoff, and others. Cases of tuberculous iritis have also been cured by this method by Rennert,[8] Dörschlag,[4] Wolfrum,[5] and Ziegler.[6] Stock,[7] Bull,[8] Török,[9] Herford,[10] Erdmann,[11] Rohmer,[12] Reuchlin,[13] Kraemer[14] and others have also tried it with success in cases of tuberculous affections of the lids, tuberculous conjunctivitis, keratitis, iritis, sclerítis, choroiditis, and retinitis. That tuberculin does cure these cases, there is now no reasonable doubt, but it is still open to question, whether the "cure" as recommended by v. Hippel is sufficient in all cases. It is true, that he carries on the treatment for several months after the progress of the disease of the eye has been apparently arrested, and that he does not seem to have had any relapses. But, after all, the ocular affection is in many instances only secondary to a primary focus elsewhere, and so long as that is not cured, the patient is liable to relapses. There is some probability that the patient cannot be regarded as definitely cured until he does not react to very much larger doses than 1 mg. And even when he does not react to *e.g.* 4 mg., he should be tested a few months after he has been discharged, when he may be found to react to very much smaller doses than those with which he left off. In such a case the "cure" will need to be repeated. Ultimately, he will not react to 150, 250, 500, and even 1000 mg. even some time after the "cure" has been stopped. He may then be considered to be definitely cured. This is the treatment which is meeting with great success at the Stuttgart Sanatorium (Kraemer).[14]

Wright's Opsonic Index.

Sir A. Wright, as is well known, advocates very small doses, which are given at intervals, regulated not by the temperature, but by the quantity of opsonins in the blood, as shown by the greater or lesser activity of the leucocytes. Whether the opsonic index is a suitable guide is a question which is still *sub judice*. The weight of evidence at present, however, appears to be unfavourable. It must be understood that this unfavourable evidence does not refer to Wright's method of tuberculin treatment with small doses at long intervals, which is based upon the observation that the opsonic content of the blood diminishes after an insection of tuberculin, that it takes some time to increase and reach, or exceed, its former level and that the results are better, if the doses are small and are given during the increase in the opsonic content or, as Wright puts it, during the positive phase. These observations are not challenged. What his critics doubt is that his method of determining the condition of the blood is sufficiently accurate to be of any use.

Some investigators maintain that the "probable error" involved in determining the index is so large as to render the index useless (Reyn,[15] Kjer-Petersen,[15] Greenwood[16]). Many

observers (Moss,[17] Jeans and Sellards,[18] Park and Biggs,[20] Cole and Meakins,[19] Fitzgerald, Whiteman, and Strangeways,[21] Jürgens[22] and others) have pointed out numerous sources of error. Some of them have given up determining the index, as they found that they got no help from it in treating their patients. Probably the most that can be said about it at present is that large differences in the index, and more especially high indices (Greenwood[16]) do mean differences in the opsonic content of the blood, but that the meaning of small differences is doubtful. Wright's index is an empirical one, and it suffers in consequence. We do not know as yet whether phagocytosis plays the important part attributed to it, nor do we know whether the opsonins play any part whatever in immunisation.

Tuberculin treatment, guided by the opsonic index, has been employed in eye affections by Snell,[23] and Hancock and Mayou.[24] As was to be expected, the patients benefited by the tuberculin treatment. Hancock and Mayou treated five cases of tuberculous iritis and four cases of tuberculous scleritis. They do not express an opinion as to the help they obtained from determining the index. At the beginning of the cases of iritis they took the index, but after it had begun to rise, they went on with the treatment, guided by the local reaction alone. The local reaction, they found, corresponded to the negative phase, and, allowing the positive phase ten days to reach its maximum, they gave their injections on the eighth day. In the cases of scleritis they found the local reaction insufficient to judge of the condition of the patient without the opsonic index.

Spengler's Tuberculin Treatment.

A modified tuberculin treatment has been introduced by Spengler,[25] of Davos. Spengler finds, that animals infected with the human as well as the bovine bacillus contain agglutinins and precipitins for both of these bacilli, but that, if infected with one type only, they contain agglutinins and precipitins for this type alone. According to Spengler, human serum contains the agglutinins and precipitins for both types, and *the bacilli can be distinguished in the sputum of the patient.* In his opinion, the toxins of the human and bovine tubercle bacillus are mutually antagonistic and destructive. Acting upon this assumption, he treats patients predominatingly affected with human tuberculosis by injections with bovine tuberculin, and *vice versa.* Under this treatment the fever diminishes, the appetite increases, sleep becomes regular, cough and expectoration become less, and the general condition of the patient improves. At the same time the number of bacilli in the sputum diminishes in a marked degree. Spengler commences treatment with a dose of $\frac{1}{10000}$ mgr. tuberculin T.R., or $\frac{1}{100000000}$ to $\frac{1}{1000000}$ mgr. tubercle vaccine.

Without first establishing a diagnosis of bovine or human

infection, Allen[25] has treated eye patients empirically upon similar lines, his reasoning being, that man is susceptible to both varieties of the bacillus, and therefore, if a patient is not doing well under human T.R., he may do better under bovine T.R. The results appear to have been satisfactory, although no definite statement can be made.

v. Behring's Tulase-Lactin.

In 1901 v. Behring discovered that it was possible to immunise cattle against bovine tuberculosis by a process of active immunisation. His first method consisted in intravenous injections of attenuated tubercle bacilli. Later, he prepared a paste of tubercle bacilli and chloral hydrate and allowed it to stand for some weeks, during which a deposit gradually formed and a clear fluid above it. The latter, when emulsified with water, forms a milky fluid, "tulase-lactin," which, injected subcutaneously or intravenously, produces active immunisation. Applied in this way to horses a serum can be obtained—"anti-tulase"—which may be employed for passive immunisation.

Collin[26] tried the method for ocular tuberculosis; twelve cases he treated with "tulase-lactin," thirteen with "anti-tulase," and six with both. He observed that "tulase-lactin" produced a general reaction with a rise of temperature, and in a few cases a local reaction. "Anti-tulase" caused a local reaction in recent cases, but none in old ones. The results of the treatment as regards the eye appear to have been promising, but necessarily a much larger number of cases is required before we can arrive at any definite conclusion.

Staphylococcic Vaccine. Pneumococcic Vaccine. Gonococcic Vaccine.

H. Grey Edwards[27] has been successful with staphylococcic vaccine in three cases of hypopyon ulcer and Allen[28] has treated similar cases with pneumococcic vaccine, which also did well.

E. E. Maddox[29] tried staphylococcic vaccine in a case of operation for cataract which became infected. "Pus was visible along the whole line of incision," . . . . "the vitreous was becoming grey and turbid, the iris rotten-looking, vision reduced to hand movements," etc., an injection of 1 c.c. of staphylococcic vaccine was followed by rapid improvement.

Allen also mentions successes in gonorrhœal conjunctivitis, especially in adults.

Small-pox Vaccine.

Trantas[30] acting upon an observation of a case of trachoma cured by an attack of small-pox, vaccinated a patient suffering

from trachoma and cured him. Trantas does not seem to have followed up this success with any further cases nor has anybody else confirmed his results.

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Sera.

Serum therapy has one great advantage over vaccine therapy, *viz.*: it renders us independent of the isolation and cultivation of the micro-organism. The bacterium need not even be known.

Serum Diagnosis.

When organisms are introduced into the body of an animal or human subject, certain hypothetical substances appear in the blood of the latter which bear a definite relationship to the organisms. Chief amongst these are the bacteriolysins, agglutinins, precipitins, and opsonins.

Some of these substances have become available for purposes of diagnosis. The agglutinins are widely used in typhoid fever (Widal's reaction), and the precipitins promise to become equally useful in other directions. The **precipitin reaction** is characterised by the formation of a specific precipitate, when

two substances, a precipitinogen and a precipitin are brought together. It requires clear and more concentrated sera than the agglutinin test, conditions which are not easily obtained, but with the help of this reaction we are independent of the bacteria themselves. We can use it therefore in cases where the bacteria cannot be agglutinated or cannot be grown in cultures, *e.g.*, spirochæta pallida, and where we do not know the organism, *e.g.*, sympathetic ophthalmitis. The reaction may be explained as follows:—when horse albumen is injected into a rabbit it induces the formation of precipitins for horse-albumen, so that serum taken from such a rabbit and added to horse albumen causes a precipitate. Such a precipitin is specific in the sense, that it does not precipitate ox albumen or any other albumen, and that it is dissolved only by an excess of horse albumen and not, *e.g.*, ox albumen. The test may be rendered more delicate by pouring the solution of horse albumen into a narrow tube and then carefully adding the serum, so that it shall form a layer above the albumen. A ring will then be seen to form at the junction of the two fluids. The test is so delicate, that horse albumen diluted to 1 : 50,000 can be detected in this way.

Precipitin is derived from precipitinogen. Instead of waiting until the precipitin is formed in the serum, we can use the precipitinogen, *e.g.*, the serum of early typhoid patients contains precipitinogen, whereas that of convalescent typhoid patients contain precipitin. If we bring the two sera together a precipitate is formed, and, therefore, by adding the serum of a suspected typhoid patient to that of a convalescent typhoid patient, we can detect the presence or absence of the fever in the former, according to whether a precipitate forms or not. It has recently been found possible to bring about this reaction in syphilis. The serum of a rabbit which has been injected with syphilitic material, *e.g.*, congenital syphilitic liver, produces a precipitate in a clear extract of syphilitic liver, similarly the serum of cases of locomotor ataxia and general paralysis of the insane produces a precipitate in a clear extract of syphilitic liver, a proof that these two diseases are of syphilitic origin (Fornet, Schereschewsky, Eisenzimmer and Rosenfeld[1]; L. Michaelis[2]; Fornet and Schereschewsky[3]; Bruck and Stern[4].) It is conceivable that the early cases of sympathetic ophthalmia contain a precipitinogen which would precipitate the precipitin of patients who have had the disease. This would enable us to establish the diagnosis of sympathetic ophthalmitis earlier and with greater confidence than we can do at present.

Another important serum reaction is that which is known as the **"deviation of complement."** (1) When ox corpuscles are injected into a rabbit, the serum of the rabbit acquires the property of dissolving out the hæmoglobin of the corpuscles. (2) We can destroy this effect by heating the serum for half an hour at 56°C. (3) The effect can be restored by adding to the

serum fresh normal rabbit or guinea-pig serum. The solution of the hæmoglobin (hæmolysis), therefore, is produced by a thermostabile substance, called the immune body, contained in (2) and a thermolabile substance, called the complement, contained in (3). Both of these substances are present in (1). The combination of ox corpuscles + inactivated hæmolytic serum (2) + active guinea-pig serum (3) is called a hæmolytic system. A few years ago Bordet and Gengou discovered, that the addition of yeast or bacterium extract to such a hæmolytic system prevented hæmolysis. The yeast deviates the complement to itself, hence the term "deviation of complement." More recently it has been shown by Wassermann and Plaut,[5] that a mixture of antigen and antibody acts like yeast. This is an important modification, for it enables us to detect the presence or absence of a specific micro-organism or a specific albumen, *e.g.*, extract of syphilitic liver added to cerebrospinal fluid from a case of locomotor ataxia, prevents hæmolysis. This reaction was first shown by Wassermann and Plaut, who also gave the explanation, that the syphilitic liver contained the antigen and the cerebrospinal fluid the antibody. Wassermann's observations have been confirmed by A. Schütze, Levaditi and Marie, Morgenroth and Stertz.

Leber[6] applied the reaction to diseases of the eye, using the aqueous humour and the serum for his investigations. He was able to obtain the reaction in 100 per cent. of clinically undoubted cases of syphilis, including parenchymatous keratitis, iritis, neuritis, scleritis, ocular manifestations of locomotor ataxia, general paralysis of the insane, and cerebral syphilis.

Römer[7] used the reaction in his studies on cataract. He found that the serum of rabbits injected with lens albumen contained antilens bodies, so that lens albumen brought together with antilens serum, caused deviation of complement and prevented hæmolysis. He also found, that normal human serum contained antilens bodies, a discovery which led him to think that the serum of persons affected with cataract might contain a greater proportion of these bodies. This, however, did not turn out to be the case.

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Serum Treatment.

Serum treatment has not advanced as rapidly as serum diagnosis, and the progress made has been due largely to empirical methods. We know still too little about the protective substances contained in immunised sera to apply them scientifically to the treatment of infective diseases in general.

On reading through the literature on the subject one cannot but feel impressed by the fact, that very different diseases can be treated, and apparently successfully treated, with one and the same serum, and *vice versa*, that one and the same disease may be cured with very different sera. It was shown many years ago, that pneumonia could be cured with antidiphtheritic serum. The same applies to the eye; pneumococcal infections of the cornea improve rapidly under treatment with antidiphtheritic serum. Apparently, yeast serum can be used successfully in many ocular affections. Tetanus serum, again, has been applied successfully in the treatment of corneal ulcers.

We have become so used to the idea that the body produces specific bactericidal or antitoxic substances for every kind of organism, that we are inclined to maintain an attitude of doubt when we hear of observations such as those outlined above. But the names and numbers of the observers compel us to accept the statements as accurate statements of fact, and in the interests of progress and truth, the best we can do is to give non-specific serotherapy a trial.

Anti-diphtheritic Serum.

In diphtheritic affections of the eye anti-diphtheritic serum is used everywhere, as a matter of course, and I need do no more than mention it. Anti-diphtheritic serum, however, is useful in a number of affections not due to Löffler's bacillus. Darier tried it first in 1903 in a case of streptococcic conjunctivitis with ulceration of both corneæ. The ulcers disappeared almost without a trace of their former existence. Since then the same author[1] has met with similar success in cases of hypopyon-keratitis, purulent conjunctivitis, including gonnorhœal conjunctivitis, pseudo-membranous conjunctivitis, infection after cataract operation, perforating wounds of the eye, etc. He does not, however, trust to serum treatment alone, but combines it with local treatment. Fromaget cured two cases of hypopyon ulcer due to the pneumococcus, but found the serum of no use in a staphylococcal infection. Teulières[2] obtained good results with it in infected wounds, iridochoroiditis, traumatic cataract, etc., and Monbouyran[4] in six cases of hypopyon-ulcer. Burkard[3] tried it in an altogether different affection, *viz.*, exophthalmic goitre, and saw good or excellent results in four out of five cases.

Antipneumococcic Serum.

No more dangerous form of corneal infection exists than that due to the pneumococcus. An antipneumococcic serum which would cure such a condition as the serpiginous ulcer, rapidly and with certainty, would be welcome to all ophthalmic surgeons. But the difficulties in the way of producing a successful serum of this kind have been almost insuperable and it is only recently that the prospects have been growing brighter. Among ophthalmic surgeons Römer has devoted a great deal of attention to the subject. After Kindborg and others had shown that mice, which had been injected with a particular strain of pneumococci, became immune only as regards that strain and no other, Römer tried a polyvalent serum, *i.e.*, a serum obtained by immunising the animal with several different strains. With this serum he was successful in treating pneumococcal infections of the eye, bnt other observers did not obtain equally good results. Subsequently, Bail published his researches on aggressins. Bail filtered the peritoneal exudate obtained from animals infected with typhoid bacilli, and found that other animals injected with the fluid became an easy prey to small doses of typhoid bacilli. He concluded, therefore, that the exudate contained an aggressive substance which he called "aggressin." Further, he observed, that the serum of animals treated with small quantities of the exudate contained anti-aggressins, and that these animals could in this way be rendered more highly immune than animals immunised by other methods. The serum of these animals proved to be exceedingly good for passive immunisation. Acting upon Bail's discovery, Römer[5] prepared an anti-pneumococcic serum upon similar lines, which is now upon its trial. Another step in advance was made by the same indefatigable author. He found that the virulence of the pneumococci was not the same in all corneal infections, that it varied from 1 : 40 to 1 : 150,000 in the case of serpiginous ulceration. He ascertained what degree of virulence led to serpiginous ulceration, and what degree of virulence could be met by serum treatment.

The new serum was to have been prepared and placed upon the market by the Höchst Farbwerke at the end of last year. No results concerning it have been published as yet.

Antigonococcic Serum.

Encouraging results have been obtained by Knapp[5] with Torrey's serum. He used it in a case of gonorrhœal iritis, with success. It has not been found to be of any value in gonorrhœal conjunctivitis.

Yeast Serum.

Yeast serum, introduced by Deutschmann[6], is a polyvalent serum obtained from rabbits which have been fed upon yeast. Deutschmann found it useful in perforating wounds, hypopyon keratitis, post-operative infections, recurrent iritis, acute purulent iridocyclitis, a case of sympathetic ophthalmia (in which the exciting eye was not excised), gonorrhœal infections, etc. His results have not yet been confirmed.

Antituberculin Serum.

Antituberculin sera, of which there are about half-a-dozen, have not been found of any value. Bock[7] tried Marmoreck's serum in tuberculous diseases of the eye without success.

Other Sera.

Anti-staphylococcic serum, opsonin serum, anti-syphilitic serum, etc., are still in the early or earliest stages of development.

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TRANSLATION.

THE GENERAL PATHOLOGY OF THE PUPIL.*

BY

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(*Abridged Translation by* T. HARRISON BUTLER, M.D.)

BACH divides his subject into three divisions: the pathology of: (I) *the pupil contractor mechanism:* (II) the *dilator mechanism;* and (III) a description of the phenomena of the *Argyll Robertson pupil.*

I.—The Abnormalities of the Pupil Contractor Mechanism.

In unilateral loss of function of the retina or of the optic nerve

* From *Zeitschrift für Augenheilkunde*, Dezember, 1907.

when light falls upon the eye, the direct pupil reflex is absent, and also the consensual reflex of the second eye. When the opposite eye is illuminated both reflexes are obtained. The pupil of the amaurotic eye is, in uncomplicated cases, larger than the other pupil. The accommodation reflex is present on both sides, and both pupils show the sensory reflex and the cerebral synkinesis. When both retinæ or optic nerves are functionless, both direct and consensual light reflexes are absent and the pupils are dilated. A modified accommodation reflex can be elicited, but it is almost certain that *the pupil shows no dilatation in response to either sensory or emotional stimuli.* Variations from this syndrome, if we can exclude complications, such as centrifugal lesions of the visual tracts, should suggest an *elective* disease of the optic nerve fibres or of the nerves supplying the pupil.

Unilateral absence of the pupillary reflex.—When light from either temporal or nasal side falls upon a normal eye *both* pupils contract; under certain conditions, however, when half of one retina is illuminated *neither* contracts normally. The characteristic of this reaction is not that the reflexes are *obtained* by unilateral illumination, but that they are *absent* when light fails upon the other side of the retina.

The lesion is generally bilateral, rarely unilateral. The convergence reflex and reaction to actual and psychic stimuli are normal. The reflex is not often entirely absent in this test, on account of diffused light stimulating the active field of vision. This hemianopic pupil inactivity is found :—

(1) In a disease of the eye itself which results in hemianopsia.
(2) In unilateral lesions of the optic nerve.
(3) In changes in the chiasma.
(4) In disease of the optic tract.
(5) In lesions of the anterior corpora quadrigemina or in the III nerve nucleus.

In fact, so long as the pupillary and visual nerve fibres run together are hemianopsia and the hemianopic inactive pupil associated; *after* the paths separate just before they reach the external geniculate bodies we get *either* hemianopsia *or* hemianopic loss of reflex.

The absolutely Inactive Pupil.

This is caused by a lesion of the centrifugal reflex arc—that is to say, between the nucleus and its peripheral nerve connections. In this condition the three chief reflexes are absent; the direct and consensual reaction, the accommodation reaction, and the dilatation to sensory or psychic stimuli. These symptoms are generally due to paralysis of the sphincter iridis. Very seldom are they caused by a spasm of the sphincter, or by a condition of irritability of the dilator fibres. The lesion causing the paralysed

pupil can lie in any part of the optic tract from eye to nucleus, or it may be due to an inhibition of the function of the III nerve by cortical impulses. It has been suggested that eserine, which acts by stimulating the short ciliary nerves, may be of value in localising the lesion ; but this has not proved to be the case.*

The cause of paralytic inactivity of the pupil may be the result of widely differing diseases ; the chief part is played by *infections*, *intoxications*, and *ocular traumata*. There is probably also a congenital sphincter paralysis. Recent researches add *hysteria*, *epilepsy*, and *great excitement*. Other causes are high tension and seclusio pupillæ.

The Neurotonic and Myotonic Reaction (Saenger.)

The characteristic of this abnormality is the relatively long persistence of the pupil in the contracted or dilated position. The change from one position to the other may be normal or slower than usual. This reaction is generally associated with organic disease. The neurotonic reaction is generally caused by a lesion of the centripetal reflex tract, the myotonic is found with centrifugal disease. The pupil only reacts when light has acted upon the eye *for some time*, or after a *prolonged* effort of convergence.

II.—The Pathology of the Dilator Centres and Tracts.

Until recently the dilatation of the pupil has been regarded as essentially, perhaps exclusively, due to excitation of those sympathetic nerve fibres which are distributed to the iris. To-day the part played by the sympathetic in causing mydriasis is overshadowed by the opinion that inhibition of the sphincter innervation, the oculo-motor nerve, is the dominant factor in dilating the pupil.

In consequence, the pathology of mydriasis falls under two heads :—

1. Pathology of the cervical sympathetic—*active mydriasis.*
2. Pathology of the tracts and centres which are responsible for *passive mydriasis.*

(1) Active Mydriasis.

Strong stimulation of the cervical sympathetic causes maximal mydriasis, even in spite of powerful illumination of the eye.

Such a spastic mydriasis is uncommon in human pathology, but *Horner's syndrome* is by no means rare. It comprises the simultaneous appearance of myosis, ptosis, enophthalmos, and hypotony. The symptoms are not always strongly marked, and some may be absent. The opinion that with the appearance

* With regard to this use of eserine, *see* THE OPHTHALMOSCOPE, February, 1908, p. 101.—EDITORS.

of myosis as a sequence of destruction of the cervical sympathetic the light and accommodation reflex are wanting must be energetically disputed. The reaction follows stimulation *promptly*, but the degree of contraction may be curtailed. The mydriasis from emotional and direct stimulation persists.

Horner's symptom-complex has been very often experimentally produced in animals by section of the cervical sympathetic or removal of the superior cervical ganglion.

The same syndrome has followed similar operations upon man for the relief of glaucoma, etc. The interesting and *practically valuable fact* has come to light that these symptoms, which appear as the immediate result of this procedure in animals, do not persist; the contracted pupil soon dilates. If this be also the case in human pathology, there is a contra-indication to the operation for removal of the superior cervical ganglion in glaucoma. Probably there is no great difference between the clinical picture seen after gradual or sudden interference with the cervical sympathetic.

(2) Passive Mydriasis.

Disturbance of the function of passive mydriasis, the result of inhibition of the III nerve impulses, can only be clinically detected by the absence of dilatation from *psychic and sensory stimulation;* and in those two typical anomalies—the *absolutely inactive* pupil, and the *Argyll Robertson* pupil.

The organic causes of these alterations are very varied. In the totally inactive pupil the sphincter is absolutely paralysed, and in consequence cannot become more relaxed; cerebral synkinesis is absent. The lesion must be looked for in the muscle itself or in the nerve centres or tracts which are associated with it.

In this case it appears to be a fact that failure of passive mydriasis is, without exception, the result of paralysis of the sphincter iridis.

The deductions from experiments upon animals are not so clear as from clinical observation on man. Some authors state that division of the oculo-motor nerve entirely abolishes passive mydriasis; others say that in spite of section of the short ciliary nerves and removal of the ciliary ganglion, passive mydriasis can be obtained, and *only* disappears when the cervical sympathetic is cut.

The differences can, perhaps, be explained by the experiments not being quite comparable, or in a difference in time when the reflexes were tested, for immediately the innervation of the sphincter is cut off spasm of the muscle results, which passes off after a time.

There is room for much research to settle the question "Is passive mydriasis the result of relaxation of the sphincter, or stimulation of the dilator mechanism?"

III.—The Argyll Robertson Pupil.

Passive mydriasis is not only absent in the absolutely inactive pupil, but also in that condition known as the Argyll Robertson phenomenon (*reflectorische Pupillenstarre*). The cause is not to be found in the sphincter or in its associated centrifugal nervous system, but higher up than the III nerve nucleus.

Experimental research has taught us that the inhibition of the oculo-motor tone which results from emotional stimuli takes its origin in the cerebrum. Possibly the medulla oblongata plays a part. Probably, therefore, the Argyll Robertson pupil is caused by lesions of the cerebrum or the tracts between it and the lower centres.

In the typical Argyll Robertson pupil both direct and consensual light reflexes cannot be obtained, but the accommodation reflex may be not only present, *but more easily obtained.* Myosis is the rule. The Argyll Robertson pupil develops gradually in the course of months or even years.

Variations in the Clinical Picture.

There are innumerable varieties of the symptom. The phenomenon may be unilateral, or more decided on one side; or the absence of reflex myosis may be more or less marked than the corresponding mydriasis.

The pupils are often *unequal*; if small inequalities be taken note of, in 50 per cent. of all cases.

The *size* of the pupils may vary from day to day, but generally only in cases where the symptom is not fully developed.

Cases of *intermittent* Argyll Robertson pupil are most probably non-existent, and reported examples are wrongly diagnosed, being confused with a recovering totally inactive pupil.

Irregular pupils are common, but by no means characteristic of the Argyll Robertson pupil. The cause is unknown.

The "*lid closure reaction*," that is, the synchronism between the closing of the lids and the dilatation of the pupil, is easily obtained in this condition, because the disturbing associated action of light is absent.

The Causes of Myosis.

In typical cases of Argyll Robertson pupil myosis is present, whereas, considering the fact that the pupils do not contract to light, one would have expected mydriasis. Opinions as to the cause of the myosis vary widely. Bach thinks that Erb's view is the most probable, namely, that the myosis is due to the failure of the pupil to dilate to sensory stimuli. He thinks the myosis has causal affinity with the myosis of sleep and narcosis.

The Cause of the Inactive Pupil.

The majority of authors place the anatomical lesion in the nerve tracts connecting the oculo-motor nucleus with the optic tract. The localisation of the lesion producing the Argyll Robertson pupil is an open question. (In the paper the various views are mentioned.)

The Differential Diagnosis Between the Totally Inactive and the Argyll Robertson Pupil.

This is very important, since the two conditions must be sharply differentiated. Many authors have described the totally inactive pupil as the advanced stage of an Argyll Robertson pupil, and have described the reactionless pupil in general paralysis and tabes dorsalis as the *Absolute Argyll Robertson Pupil* (*totale reflektorische Starre*). This view must be energetically controverted; it has caused much confusion. Generally there is no proof that the inactive pupil was preceded by the Argyll Robertson condition; and even when one has followed the other, the fact does not determine the similarity of origin or localisation of the two lesions. Both pupil phenomena must be kept absolutely distinct. The typical picture of the Argyll Robertson may remain unaltered for years. It is in no wise the rule that eventually the pupil becomes inactive to all stimuli.

The difficulty of making the differential diagnosis can be increased by the pupil anomaly under consideration being either not fully developed or retrogressive.

A recovering totally inactive pupil is especially liable to be confused with the Argyll Robertson pupil.—With a retrogressive reactionless pupil a stage can arise when the light reflex causes no myosis, but the stronger convergence impulse causes the pupils to contract. But this reflex is either very slight, or is very slow in developing; whereas with the Argyll Robertson pupil it is prompt and well-developed. The greatest weight must be laid on this difference.

The Paradoxical Light Reaction.

This is a pupil which dilates to light, contracts to shadow. It has no pathological significance. The majority of cases rest upon false diagnosis, the result of ignorance of the pupil phenomena, and an insufficiently comprehensive examination. It is a rare condition.

See-Saw Pupils (Springende Pupillen).

This variety is equally rare. Under the heading "see-saw pupils" we find described anomalies which differ both clinically and causally. Three groups can be differentiated. In the first group are pupils which in quite definite intervals, fractions of a

second, irrespective of illumination and accommodation, alternately dilate and contract. This clinical condition is seen in congenital or early acquired paresis of the III nerve. In the second group the same symptoms are unilateral, and they depend upon unilateral paresis of the oculo-motor nerve. In the third group the comparative size of the two pupils keeps altering. The change is generally a widening of the pupil, to-day the right is dilated, to-morrow the left; in consequence, this variety has the synonym "dancing mydriasis."

These pupils were first noticed in tabes and general paralysis, and so "dancing" or 'see-saw pupils" were held to be of gravest import.

Recently the abnormality has been regarded as of no great importance; it has been discovered in functional disorders, and even in the healthy.

Hippus Iridis.

Normal oscillation of the pupil is often mistaken for hippus. Agreeing with Gaupp, Bach defines hippus as "rhythmic contractions and dilatations of the pupils occupying on an average from 1-3 seconds, which are *generally* unassociated with variations in illumination." The excursions are approximately equal, and measure about 2-3 mm. Hippus is generally bilateral, seldom unilateral. It has no diagnostic import, and its cause is unknown.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—THE VENOUS CONNECTIONS OF SCHLEMM'S CANAL.

Henderson, Thomson. — The venous connections of Schlemm's canal. *Trans. Ophthalmological Society U.K.*, Vol. XXVIII, fasc. 2, 1908.

The contribution of **Henderson** (Nottingham) is particularly opportune at the present moment when questions affecting the anatomy of parts about the filtration angle of the eye are attracting considerable attention. The object of the present communication is to show the close venous connection that exists between iris, supra-choroidal space, and Schlemm's canal. The arterial supply to the anterior parts of the uveal tract comes from the two long posterior ciliary arteries, as well

as from the eight anterior ciliary arteries, which together form the circulus arteriosus iridis major, at the ciliary edge of the iris, and the circulus arteriosus minor, at the pupillary edge of the iris. It is singular, as Henderson points out, that the arterial supply to the iris is out of all proportion to the anatomical structure and physiological requirements of that body. All venous blood from the eye is returned through the venæ vorticosæ, with the exception of a small area on the outer aspect of the ciliary body, which is drained by the tiny anterior ciliary veins. The last-named form anastomoses with Schlemm's canal.

The foregoing schema of the vascular arrangements is accepted by everybody. Henderson alone is in opposition. He points out that if an extensive series of serial sections of the pericorneal circumference be studied and if a composite diagram of the course of the vessels so traced be made, a picture fundamentally different from Leber's conceptions, as outlined above, will be the result. Random sections, on the other hand, show nothing directly opposed to Leber's conclusions.

Exceptions to accepted teaching brought out by Henderson's examinations of serial sections are the following: 1. The total number of vessels perforating the sclera at the pericorneal circumference is nearer fifty than sixteen, as described by Leber; 2. The weakness of the sclera at this point is due not to the mere presence of Schlemm's canal, but to the fact that the region is simply honeycombed by anastomoses between perforating and non-perforating vessels; 3. Each perforating vessel is connected by one or more branches (afferent, efferent, or both) with Schlemm's canal. Henderson has never been able to find a single anterior perforating vessel, that when traced in serial sections, was not connected, directly or indirectly, with Schlemm's canal. From all this it follows that every one of these perforating anterior scleral vessels are veins, and since these vessels are connected directly with the so-called circulus arteriosus iridis major, that the last-named structure is, in reality, a circulus venosus and not a circulus arteriosus. The main venous return from the iris, as well as from a great part of the ciliary body, is by way of the anterior perforating scleral vessels, in addition to the venæ vorticosæ. Before they enter the sclera these perforating vessels communicate with the radicles of the venæ vorticosæ, while after entering the sclera, they are linked together by a large number of anastomosing branches, of which the most important are those to and from Schlemm's canal. In fact (as Leber has always insisted), Schlemm's canal is nothing more than a venous sinus, formed by the iris and ciliary veins as the latter pierce the sclera at the pericorneal circumference. The afferent branches enter the posterior margin of the venous sinus, while the efferent branches leave its anterior extremity, as demonstrated by cases of chronic irido-cyclitis and of sarcoma in which pigment in the anterior chamber can

be seen travelling out by this route. That Schlemm's canal so often appears in two, three, or more divisions, is due to these entering and leaving tributaries. The main vessels of the venous system of the iris and ciliary body, as well as the afferent and efferent veins of Schlemm's canal, are surrounded by perivascular lymph spaces. The sheath is absent from the inner side of Schlemm's canal, with the consequence that the aqueous humour comes into direct contact with the walls of the sinus in question. We may sum up by saying that the examination of serial sections shows that the iris-veins and the anterior perforating vessels are all part of one venous system, which acts as a connecting link between the three regions of the iris, supra-choroidal space, and Schlemm's canal, through which the aqueous escapes.

Henderson describes the association between the venous return, on the one hand, and the outflow of aqueous, on the other, as follows: by means of the crypts of the iris the aqueous humour comes into direct contact with the iris-veins, which form a sinus venosus at the periphery of the iris. Branches from the sinus again come into direct contact with the aqueous in their passage across the supra-choroidal space, and, finally, the vessels, in perforating the sclera, send out vascular loops to form Schlemm's canal.

The bearing of these anatomical details is especially important as regards glaucoma. Henderson maintains that the ætiological factor in primary glaucoma is to be found in a physiological sclerosis of the cribriform ligament. This change reduces the available outflow of aqueous, and thereby throws more work upon the crypts of the iris. Should the crypts prove unequal to the demands made upon them, the intra-ocular pressure rises. The increased tension by raising the intra-venous pressure, must cause congestion of the linked venous systems within the eye. Under such circumstances, the blood from the ciliary body will tend towards the nearest exit—that is, through the anterior perforating scleral veins. The remoter effects will include additional congestion of the iris, further failure of filtration, and the production of a vicious circle. Moreover, a process of congestive œdema will lead to adhesion of the root of the iris, which, in this view, is a purely secondary process, depending entirely upon the acuteness and degree of the congestion. Similar agencies are at work in secondary glaucoma, where inflammatory products block the angle and the crypts of the iris. Henderson insists that functional abolition of the crypts spells also abolition of absorption. The author has never been able to satisfy himself that in cases of chronic glaucoma Schlemm's canal is occluded as the result of pressure. On the contrary, he has invariably found newly-formed vessels perforating the cribriform or pectinate ligament, thereby causing a direct communication between the veins of the iris and Schlemm's canal. These vessels represent, in fact, an attempt on the part of Nature to facilitate the outflow and thus to restore equilibrium.

Myotics help to restore equilibrium by stretching the iris, and in that way keeping the crypts widely open. The success of an iridectomy in the same direction depends upon the fact that the cut surfaces which form the base and pillars of the surgical coloboma never heal, so that the ultimate effect is that "of a large crypt occupying three sides of a square." The aqueous drains away readily through the large raw surface resulting from the iridectomy, always supposing that operation has been done before the structural damage to the iris has gone too far.

"In conclusion," writes Henderson, "I would summarise by stating that serial sections show that the blood from the iris and a greater portion of the ciliary body is returned by way of between forty and fifty perforating scleral veins, and that Schlemm's canal is only an offshoot from these vessels."

SYDNEY STEPHENSON.

II.—LAGRANGE'S OPERATION FOR GLAUCOMA.

(1) **Rochon-Duvigneaud.** — **The conditions essential to success in irido-sclerectomy (Lagrange's operation).** (**Les conditions d'efficacité de l'irido-sclérectomie—opération de F. Lagrange.**) *Archives d'Ophtalmologie* mars, 1908.

(2) **Weeks, J. E.** — **Lagrange's operation.** *Archives of Ophthalmology*, May 1908, p. 336.

(3) **Valude, E.** - **Irido-sclerectomy.** (**Apropos de l'irido-sclérectomie.**) *Annales d'Oculistique*, mai, 1908.

(1) *Apropos* Lagrange's operation of irido-sclerectomy, **Rochon-Duvigneaud** has a closely-reasoned criticism in the March number of the *Archives d'Ophtalmologie*. He sets out by enquiring whether the cure of an acute glaucoma by iridectomy is precisely the same thing as the reduction in tension determined by a subconjunctival fistula, such as may result from Lagrange's operation. Lagrange appears to be of the opinion that the effect of both operations is due to filtration through the cicatrix, a view directly opposite to that held by Rochon-Duvigneaud. As the latter points out, certain cases of acute glaucoma are definitely cured by iridectomy, although the cicatrix is as impermeable as the sclera itself. In such cases the normal excretory channels, as Schlemm's canal, are retained or re-established. On the other hand, by Lagrange's operation one obtains the permanent "*fistulisation*" of an eye, of which the natural excretory channels are obliterated. A practical question is, how can we be certain of having created a true filtration by fistula, a real safety-valve against hypertension? Lagrange's

irido-sclerectomy, like all operations upon the eye, may be well or badly done. For example, unless the scleral flap be well-shaped and excised right up to its base, it is evident that a trans-scleral loss of substance is not effected. The sclera under other circumstances is only thinned, and the effect of the mere shaving taken from it will be *nil*. How can we determine this point? Only, replies Rochon-Duvigneaud, by the appearance of the scar after definite cicatrisation—that is to say, when the anterior chamber has been re-formed. If there be scleral "*fistulisation*," the conjunctiva will remain puffed up at the spot, and the tension will be more or less *minus*. One may then anticipate the maximum effect of the operation, in so far as concerns suppression of hypertonus. On the contrary, a dark spot in the position of the scleral excision, unaccompanied by conjunctival œdema, conveys to Rochon-Duvigneaud the impression that there exists no filtration—there is, in other words, simple scleral thinning, without a fistula. A favourable result under the circumstances described is to be attributed to the iridectomy and not to scleral filtration, of which no evidence can be obtained. With regard to this point, there is thus a difference of opinion between Lagrange and Rochon-Duvigneaud. Stated plainly, the latter believes that Lagrange's first variety of filtering cicatrix (see THE OPHTHALMOSCOPE, May, 1908, p. 370) does not filter at all. Improvement in a chronic glaucoma showing this variety of cicatrix is due solely to the effect of the associated iridectomy. Rochon-Duvigneaud believes that irido-sclerectomy can be useful only in cases where the operation produces a localised swelling of the conjunctiva, which indicates the existence of an underlying scleral fistula (Lagrange's third variety of filtering cicatrix). In all other cases, despite appearances, iridectomy has simply been performed. As bearing upon this point, Rochon-Duvigneaud gives two cases:

Case No. 1.—The author performed Lagrange's operation, with a large scleral resection, upon an eye affected with chronic glaucoma, with slight hypertension, deep excavation, and sight reduced to 1/50. After cicatrisation was complète, a loss of substance, about 3mm. by 2mm., could be recognised through the œdematous conjunctiva. What has happened to this eye since the operation was performed thirteen months ago? To begin with, the subconjunctival fistula persists and presents the same characters as formerly; secondly, the tension of the eye is much reduced; thirdly, the anterior chamber is not so deep as was once the case; fourthly, atropine, dropped into both eyes by a mistake, caused an attack of acute glaucoma in the eye that had not been operated on, but failed to modify the state of the other one; fifthly, at the end of several months it was found that the glaucomatous excavation had become filled in, without, however, any modification in the atrophic colour of the optic disc; and, sixthly, sight has remained stationary.

Case No. 2.—Rochon-Duvigneaud performed a large iridectomy, with a small scleral excision, on the left eye of a woman with chronic glaucoma. The sight of the eye thus treated was reduced to the perception of light. After cicatrisation, there was no conjunctival œdema, and very slight blackish ectasia in the scar, a picture corresponding to the first variety as described by Lagrange. The operation was done eight months ago. Tension, although a little reduced, still remains somewhat above normal; sight is now equal to the recognition of hand-movements; and excavation persists.

The diagnosis between the two kinds of cicatrix is essential. If a true fistula filtration has been obtained, it is quite useless in case of failure to interfere again. On the contrary, if hypertension persists, it is because one has failed to "*fistulise*" the sclerotic, and a supplemental operation may be indicated.

Rochon-Duvigneaud concludes his communication with the following words:—"Lagrange has had the happy and simple idea of replacing an inadequate scleral incision by an excision. But, imbued by the ideas of de Wecker, he has not, to my mind, clearly distinguished between a true filtering cicatrix (trans-scleral fistula) and that which only appears to be such (scleral thinning). He has therefore himself introduced a source of error, capable of inducing one to believe his operation to be inadequate in cases where the only fault has been an insufficient resection of the sclera. We may sum up matters by saying: irido-sclerectomy—applicable to every case in which simple iridectomy has failed to reduce tension—must be "*fistulisante*" or not so.

SYDNEY STEPHENSON.

(2) At a meeting of the Section on Ophthalmology of the New York Academy of Medicine, held on January 20th, 1908, **Weeks** (New York) presented a number of cases of simple glaucoma on which he had performed iridectomy after the manner of Lagrange (THE OPHTHALMOSCOPE, September, 1907). This operation has for its object the formation of a permanent filtration cicatrix. One eye was operated on in each of two patients; both eyes in each of two patients. Broad iridectomies were performed, the wound lying well in the iris-angle. An œdematous condition of the conjunctiva lying over the defect in the sclera was present in four of the eyes, more marked in some than in others. Tension was normal when the patients were shown in all but one eye (T. *plus* $\frac{1}{2}$). One case had been under observation three months since the operation. The most recent case had been operated on five weeks previously. The condition in all of the cases was very favourable. None had remained under observation long enough to enable Weeks to decide regarding the permanence of the filtration. In view of the tendency for the gradual and firm closure of wounds of this nature, it was unwise to draw conclusions until a large number

of cases had been watched for a long period of time. But Weeks stated that the procedure impressed him very favourably, and that he should continue to employ it in suitable cases.

(3) **Valude** (Paris) reports a case in which Lagrange's operation was performed. The facts follow :

A man, aged 65 years, suffered from chronic glaucoma, of two years' duration in the right eye and of one year's duration in the left. Painful crises, and luminous haloes. R.V. = no p. l. L.V. = hand-reflex at 10 cm. Lagrange's operation was performed upon the left eye, a large piece of sclera being excised. During removal of iris, a drop of vitreous also made its escape, an accident that led Valude to insert a suture in the conjunctiva, the better to close the scleral wound. When the man was discharged, about twelve days after operation, there was no pain, tension was normal, but there was no sight, owing to blood in the vitreous body. Twenty-one days after operation, the blood had been resorbed, and vision had risen to what it was prior to the intervention. But the anterior chamber was non-existent, the eye was harder than before, and the patient was in severe pain. Pilocarpine was prescribed. Six days later, the media were clear, sight remained unchanged, but the iris was projected forward, the eye was hard, and frontal pain, which came on soon after awaking from sleep, persisted. A good filtering cicatrix, however, was present at the level of the wound in the sclera. Eserin was now added to the pilocarpine. Nine days later—*i.e.*, 35 days after operation matters had improved. Tension was somewhat lower, the media were clear, sight was as before, and, lastly, pain had disappeared.

The foregoing case leads Valude to suggest that hypertension does not bear any fixed relation to the amount of sclera excised in Lagrange's operation. In fact, a filtering cicatrix and a gaping scleral wound afford no absolute guarantee that tension will remain slack. Thus, in his patient a painful distension of the eyeball supervened some days after operation and lasted for about a fortnight, despite the encouraging appearance of the filtering cicatrix resulting from the intervention. Valude considers that the escape of vitreous in his case furnishes an argument against unduly large excisions of the sclera. The operation of irido-sclerectomy, as proposed by Lagrange, is neither difficult to perform nor useless in its results. Valude declares, indeed, that he is a determined partisan of irido-sclerectomy. At the same time, the mechanism of the cure of glaucoma by any operation is still obscure, and much remains to be learned in that direction. The formation of a persistent scleral wound is not everything, as Lagrange appears to think, in the question of glaucoma, or even in that of hypertension.

Valude further describes the case of a colleague (evidently the late Dr. Emil Javal) whose vision had been reduced by chronic glaucoma to R.E. = fingers at 20 cent. and L.E. = 1/10. Valude performed iridectomy on the left eye and irido-sclerectomy on the right eye. The sight of the right eye improved to such an extent that fingers could be counted at two metres, and the tension of the eye fell to normal. On the other hand, the sight of the left eye was reduced from 1/10 to fingers at one metre, and the tension reached *plus* 2. Valude then performed a sclerectomy on the left eye, with the result that vision rose to 1/15. SYDNEY STEPHENSON.

III.—MALE FERN AMAUROSIS.

Schoening.—On our knowledge of Felix-Mas Amaurosis. (Zur Kenntnis der Filix-Mas Amaurosis.) *Zeitschrift für Augenheilkunde*, März, 1908.

Schoening (Bonn) has arranged in a lucid manner the chief facts known regarding this somewhat rare condition, and he adds another case to those already recorded. A useful bibliography completes the article.

Poisoning by male fern does not depend upon the dose or upon the general health of the individual, and is uninfluenced by the aperient which may or may not follow the dose. It is purely a question of idiosyncrasy, and a patient who has taken male fern without danger may, on a subsequent occasion, be poisoned by it. The 81 cases of intoxication collected by Nieden give 12 fatal results, 19 cases of permanent bilateral blindness; 15 cases of permanent unilateral amaurosis; 7 of permanent amblyopia on both sides; 4 on one side; and 2 of transitory loss of visual acuity. The blindness is caused by changes in the optic nerve and retina, but the ophthalmoscopic appearances described are of a very varied nature. The usual condition is a retrobulbar neuritis, associated with narrowed retinal vessels.

Stuelp describes a case examined twelve hours after the dose had been taken. Both pupils were dilated and inactive. The right fundus showed extreme œdema of the retina, which was snow-white in appearance. Neither papilla nor macula could be distinguished. The vessels could be seen only here and there, the arteries were thread-like, and the blood in them formed little detached columns. The veins were tortuous. The left fundus was very similar. Stuelp regards felix-mas amaurosis as due to spasm of the retinal vessels. Uhthoff thinks the poison acts directly upon the optic nerve and retina. Nuel ascribes the blindness to a retrobulbar neuritis. Treatment should be directed towards eliminating the poison from the body as rapidly as possible. The stomach should be washed out; and copious enemata of soap and hot water be administered. Perspiration should be encouraged with aspirin or pilocarpine; much water should be drunk. The inspiration of amyl nitrite and injections of strychnine may be called for. Schoening, however, remarks that "these remedies have generally very little effect!"

T. HARRISON BUTLER.

IV.—JUVENILE TABES DORSALIS.

(1) **Jones, Ernest.—The symptoms and diagnosis of juvenile tabes.** *Brit. Journ. of Children's Diseases*, April, 1908.

(2) **Stephenson, Sydney.—Juvenile tabes dorsalis: notes of five cases.** *Lancet*, May 16th, 1908.

(1) **Jones** (London) discusses the clinical diagnosis of a condition which although undoubtedly rare, is of unusual interest and of no little practical importance, namely, juvenile tabes. The difficulty of differentiating between juvenile tabes and similar conditions has led some authors to doubt the existence of the former disease. Tabes has been confused with cerebro-spinal lues, and with hereditary nervous affections. It was not until Remak's work (*Berl. klin. Wochenschrift*, 1885, No. 7) that authentic cases were placed on record. There is no single physical sign of juvenile tabes that is pathognomonic of the condition, a fact, however, that does not preclude the possibility of its existence. The most serious gap in our knowledge is the fact that no diagnosis of juvenile tabes has yet been confirmed by autopsy. These considerations, among others, make it by no means an easy matter to determine how many actual cases have been recorded. But Jones considers that at least thirty veritable cases have so far been reported. With regard to sex incidence, the author believes that juvenile tabes affects males and females to an equal extent, although he mentions the fact that in some collections of figures the females preponderate (Lasarew, Marburg, Hirtz and Lemaire). Most cases show the first manifestation of tabes about puberty. As to syphilis, in most cases plain evidence is discoverable. Marburg states that a history of syphilis in the parents was found in 22 of the 34 cases in his series, and Lindser that evidence of syphilis in parent or child was certain in 17 of 21 cases, and probable in two more. Acquired syphilis may be responsible for some cases of juvenile tabes. The parents of affected children not infrequently show signs of meta-syphilis in the shape of tabes or general paralysis. Thus, Jones finds in the literature no fewer than twenty-three parents of patients with juvenile tabes who themselves suffered from either tabes or paralysis. Facts such as these naturally raise the question of a family predisposition, a probability strongly urged by some writers, notably by von Halban and by Nonne. Nonne mentions the case of a brother and sister who both developed tabes, and of twin brothers who were infected with syphilis within two years of each other, and who developed tabes at the same date. Against a family predisposition, however, is the fact that the arrangement of the cases shows a distribution different from that of any hereditary

transmission that we are acquainted with. There is no sign or symptom in adult tabes that has not also been described in juvenile tabes. At the same time there are certain peculiarities that distinguish the one form from the other. These may be summarized as follows: 1. the essential chronicity of juvenile tabes; 2. the frequency of vesical symptoms, headache, optic atrophy, Argyll Robertson pupil, anisocoria, oculo-motor paralyses, "lightning" pains, and sensory alterations; 3. the frequency with which the affection is complicated with general paralysis (Mott's "tabo-paralysis") Ataxy, on the other hand, is rare, and when present, is slight and seldom extends to the upper arms. Crises and trophic changes appear to be uncommon in juvenile tabes. As regards diagnosis, special stress is to be placed upon the Argyll Robertson pupil, the loss of the Achilles' jerk followed by that of the knee-jerk, primary optic atrophy of a characteristic type, the typical "lightning" pains, and the presence of lymphocytosis and excess of albumin in the cerebro-spinal fluid. The sign last-named, which is certainly the most constant and most valuable in the diagnosis of tabes, has been examined and found to be positive in one alone of the juvenile cases (Hirtz and Lemaire). To judge from the analogy of adult meta-syphilis and of juvenile general paralysis, this should in the future prove to be an invaluable diagnostic point. The remainder of an able communication is taken up with discussing the differential diagnosis of juvenile tabes in so far as regards "pseudo-tabes," Friedreich's disease, and juvenile cerebro-spinal lues. SYDNEY STEPHENSON.

(2 **Stephenson** (London) believes that a proportion perhaps a large one) of cases in children where the sole obvious findings include amblyopia and optic atrophy are, in reality, instances of juvenile tabes dorsalis. He does not doubt that a more searching investigation of the nervous system than is usually feasible in an ophthalmic out-patient room would result in a more definite diagnosis of such cases. But the association in a syphilitic child of bilateral, simple optic atrophy, with loss of the knee-jerks, would by itself point to a provisional diagnosis of juveniles tabes. Another suggestive combination would be paralysis of an ocular muscle with loss of the deep reflexes in a syphilitic subject. Stephenson's five cases are given in briefest abstract below:—*Case* 1.—Boy, 13 years, with very defective sight of left eye (? no p.l.). Incomplete optic atrophy, more marked in left eye. Neither pupil responded to light nor to accommodation. Ocular stigmata of hereditary syphilis in the shape of choroiditis. Seen after an interval of $2\frac{1}{2}$ years, right pupil showed the Argyll Robertson phenomenon; left inactive both to light and to accommodation. Knee-jerks absent. History of "lightning" pains in left thigh and leg. It may be noted that in the foregoing case there was a temporary paresis of accommodation as regards the right eye. *Case* 2.—Female, aged 24 years, whose

facies suggested inherited syphilis, with imperative desire to urinate, Argyll Robertson pupils, and bilateral optic atrophy. Knee-jerks absent. *Case* 3.—Female, 14 years, whose sight was less than 6/60, due to simple atrophy of the optic discs. Visual fields for white very small. Pupils sluggish to light, but acted well to accommodation (potential Argyll Robertson pupils). One knee-jerk absent, and other to be elicited only now and then with re-inforcement. Imperative desire to urinate. *Case* 4.—Boy, aged 11 years, interstitial keratitis, with osteo-arthritic changes in some of the smaller joints, as fingers and toes. Facial and dental evidence of inherited syphilis. Left knee-jerk absent; right to be obtained only on re-inforcement. Left pupil in a state of incomplete Argyll Robertson condition. Lad suffered from a weak bladder, *i.e.*, nocturnal incontinence. *Case* 5.—Boy, aged 10 years, with specific facies, and characteristic upper central incisors. Nystagmus, simple optic atrophy, and knee-jerks almost absent. G. C.

V.—THE MUNICIPAL TREATMENT OF OPHTHALMIA NEONATORUM.

Walker, A. Nimmo.—Ophthalmia neonatorum: an experiment in treatment. *Lancet*, May 2, 1908.

Walker (Liverpool) is to be heartily congratulated on the initiation of a rational method of treating ophthalmia neonatorum amongst the poorer classes. Having been struck with: (1) the length of time required for treatment of these cases, as ordinarily seen, and (2) the rapid way in which purulent ophthalmia can be cured if taken in hand at once, he has, with the aid of A. A. Mussen (Assistant M.O.H. and Inspector of Midwives to the City of Liverpool) arranged to take mother and child into a special ward of St. Paul's Eye and Ear Hospital immediately on receiving notice of a case of ophthalmia neonatorum, except when the mother refuses. One can imagine the difficulties of arranging for the safe transference of a lying-in woman from her home to the Eye Hospital, but the Health Authority in this case welcomed the idea, and arranged to send an ambulance whenever required. One would fain hope that what can be done in Liverpool by a happy combination of an eye institution and the Health Authority, acting under the Early Notification of Births and the Midwives Acts, can be done elsewhere. It is impossible to avoid the conclusion that this is an ideal method of grappling with a large proportion of the cases of ophthalmia neonatorum.

ERNEST THOMSON.

VI—OXYCEPHALY.

(1) **Coats, George.—A case of oxycephaly.** *Transactions Ophthalmological Society* U.K., 1907, p. 211.

(2) **Paton, Leslie.—Oxycephaly (moderate case).** *Ibidem*, p. 215.

(3) **Krauss, W.—On eye changes in skull deformities and their causes, with special reference to tower skull and rickets. (Ueber Veränderungen am Sehorgan bei Schädelverbildungen und ihre Ursachen, mit besonderer Benicksichtigung des sogenannten Turmschädels und der Rachitis.)** *Zeitsch. f. Augenh.*, Mai and Juni, 1907.

(1) **Coats's** patient was a boy of 8 years with cephalic index 86·6, skull highly brachycephalic, face broad and flat. He was highly hypermetropic (with astigmatism); corrected V. = R. $\frac{6}{18}$ L. $\frac{6}{24}$. No true exophthalmos, no strabismus, nystagmus, or limitation of movement; no retinal disease, and no decided pallor of discs. The deformity was present at birth and has not increased. Labour was prolonged, but otherwise normal. No sign of rickets, has had no serious illness, and is quite intelligent. There was no similar deformity in any of the relations.

ERNEST THOMSON.

(2) **Paton's** patient, a girl of 12½ years, was seen on account of outward squint, intense headaches, and deterioration of vision in the past six months. There was a moderate amount of tower-skull, eyes divergent and slightly prominent, face long and narrow. No nystagmus. Discs very pale, opaque bluish-white; lamina cribrosa not visible. Vessels normal in character: arteries possibly somewhat thickened. Under potassium iodide sight improved from less than $\frac{6}{60}$ to R.E. $\frac{6}{24}$ L.E. $\frac{6}{36}$, and the headaches were relieved. She was seen about nine months later, and vision had deteriorated $\left(\text{R.E. corrected with } \frac{+\cdot 50 \text{ D. Sph.}}{+ 1 \text{ D. Cyl. ax. } 70^{\circ}}\right)$ to R.E. $\frac{6}{24}$; L.E. $\frac{6}{60}$.

ERNEST THOMSON.

(3) **Krauss** discusses elaborately the causes of tower skull—traces the many intermediate forms, and discusses the possible association of rickets with these deformities. He arrives at no definite conclusion with regard to this association—but thinks it highly probable. The essential cause of the deformity he states to be a premature synostosis of one or more of the cranial sutures, especially of the membrane-bones, and yielding of the skull along the other sutures and the cartilaginous base. The eye affections, such as exophthalmos and atrophy of the nerve, are not to be considered as essential parts of a diseased process—but merely as a mechanical result of the deformity and that no distinction is to be drawn between the eye affections in tower

skull, rickets of the skull, or other types of skull deformity, the only true distinction being one merely of degree. The cause of these eye affections is a disproportion between the capability of the skull to expand in certain directions and the increasing volume of the skull contents; and, in consequence, the base of the skull and the orbits are pushed or expanded downwards and generally also forwards.

The cause of the disproportion between skull and contents is a chronic inflammatory process, commencing shortly after birth in the skull bones, which may or may not be a form of rickets. This leads to a greater or lesser degree of hydrocephalus, to early synostosis of one or more sutures, and to delayed ossification of the cartilaginous base of the skull. In this manner the walls of the orbit are pushed downwards and forwards, reducing the capacity of the orbit, and thus producing the exophthalmos. The increased intracranial pressure produces—first, an optic neuritis, followed by atrophy of the nerve—and all degrees of this are found, according to the severity and duration of the process. For the future, special search must be made for an associated rickets in these cases, careful pathological examination where opportunity serves, and in all cases careful Röntgen ray photographs will do much to determine the exact type of deformity. A. LEVY.

VII.—TRANSFERRED OPHTHALMITIS.

Oliver, Charles A.—The preventive treatment of transferred ophthalmitis. *Journal American Medical Association*, July 27, 1907.

"Employing the title 'preventive treatment' as it should be employed, *i.e.*, to express both the indirect and the direct preventive measures for lessening the chances of occurrence of this disease, **Oliver** (Philadelphia), offers some of them in brief detail under their two respective headings.

INDIRECT CAUSES

1. More improved and better constructed machinery, which, as a rule, has contrivances for the rapid and the safe removal of extraneous and useless débris, etc.

2. More carefully arranged, more sanitarily built, and more adequately illuminated factories, mills, shops, etc., than formerly.

3. A broader compulsory employment of personal protectives by the workmen during their occupations (as was found by comparison and contrast of the conditions prevailing at the different places from which the patients came).

4. More prompt search for and amelioration of the original disturbing conditions. Study of the cases showed that for the past ten years the time elapsing between the onset and the first examination and treatment had greatly lessened, this in great measure having been the result of the present realisation of the value of speedy relief and the increased ease of railway communication between distant centres and the hospital.

5. Better personal condition of the patient. This was so pronounced that in many cases prognosis could be determined in great measure after a cursory inspection of the general appearance of health and cleanliness of the patients; this in addition to the race, the nationality, the sex, and the age—all of which serve as greater prognostic factors than are ordinarily believed.

6. A better arrangement on the part of the hospital for immediate attention to first-aid applications and remedial measures to every case that is brought to the institution. For the past six years there has been an efficient medical officer constantly on hand to attend promptly to any case applying, while two or more of the surgical staff are nearly always to be found within a few minutes' time for personal advice and action.

7. A higher grade of skill on the part of those in charge of the cases than formerly. This has been obtained through a vast increase, and now almost constant repetition, of similarly affected cases.

8. A better equipment, always available, of all of the modern instruments and appliances known, thus allowing more or less positive results for good to be obtained within the briefest periods of time after the admission of the patient.

Direct Causes.

9. An increased certainty in intelligent action by the early employment, if necessary, of one of the most exact methods of X-ray studies in the country.

10. The prompt removal, whenever possible, of any foreign body from the interior of the eyeball by the methods which have been found to be the latest and best adapted for special cases.

11. A greater tendency toward the early removal of shattered and useless eyeballs of dangerous types by the simplest and the least complicated methods of operative procedure.

12. A better preparation of the patient for—as nearly as may be possible—aseptic operative measures or special remedial treatment in the wards of the hospital, every case being subjected to the best and the least disturbing cleansing processes for both skin and mucous membrane, each case being isolated, as far as practicable, by being placed in bed, and every affected eye being promptly treated for prevention or lessening of reaction and reduction of inflammation.

13. A more prolonged continuance of controlled therapy than formerly, thus ensuring an increased probability for permanent quiet and a greater chance of escape from subsequent disturbance.

14. Better facilities for guard over the cases for long periods of time, each patient always being personally requested, and whenever possible required through his employer, to report at fixed intervals for careful restudy of the remaining conditions."

C. A. O.

VIII.—EDUCATION OF THE CULTURED BLIND.

Weiss, K. E.—The education of the blind and half-blind members of the cultured classes. (Ueber Ausbildung von Blinden und Schwachsichtgen der gebildeten Stande.) *Die Ophthalmologische Klinik*, Dezember 20, 1907, p. 470.

Weiss, in adopting Heller's methods of teaching the blind, has had some very encouraging results with patients taken from the Blind Institute in Gmünd. He puts in a plea for a more comprehensive and thorough education of the blind belonging to the educated classes. The institutes for the blind serve the working classes. Here the Braille system is taught, and practical instruction is given in some handicraft, *e.g.*, brush and basket making, by means of which the patients may be able to gain a livelihood. Such occupation, however, does not meet the wants of a patient who is brought up in cultured and intellectual surroundings. A much higher standard of mental activity is needed. The children who have been born blind or have become blind in early childhood, must receive special instruction to prepare them for the higher schools, and while at school they must receive individual supplementary instruction with the aid of the means and methods employed for teaching the blind. The author lays great stress upon sending these children to the ordinary schools. In mixing with the children who can see and in taking part in their pursuits, the sensitive, nervous, and suspicious nature of the blind disappears, the outlook and interest in life are widened, a serene and happy frame of mind is gained, which is the result, not of hiding a weakness, but of mastering it. Properly taught, these children learn languages with ease, as most of them possess, or can rapidly acquire, a good memory. Algebra and geometry, as well as music, can be taught. Typewriting is soon learnt, and thus the blind can correspond with those who can see. They become useful members of society, with an education corresponding to their social status, and capable of taking an intelligent part in the pursuits of their more fortunate brothers and sisters.

PERCIVAL J. HAY.

IX.—FAMILY DEGENERATION OF THE RETINA WITH IDIOCY.

(1) **Nettleship, E.—Some cases possibly allied to Tay's infantile retinitis (amaurotic family idiocy).** *Trans. Ophthal. Society U.K.*, Vol. XXVIII, fasc. 1, p. 76, 1908

(2) **Stock, W.—On a hitherto not described form of family degeneration of the retina associated with idiocy, and on typical pigmentary degeneration of the retina. (Ueber eine bis jetzt noch nicht beschriebene Form der Familiär auftretenden Netzhautdegeneration bei gleichzeitiger Verblödung und über typische Pigmentdegeneration der Netzhaut.)** *Klin. Monatsbl. f. Augenheilkunde*, März, 1908.

(1) **Nettleship** (Hindhead, Haslemere) makes a suggestive but unconvincing attempt to identify as successive stages of one and the same disorder the amaurotic family idiocy of infants (Tay-Sachs' disease) and the cases affecting older children and adults, which have been described as instances of "cerebral degeneration with symmetrical changes in the maculæ" by F. E. Batten, "progressive cerebral degeneration (family type)," by R. Hutchison, and "cerebral degeneration with fundus changes," by the reviewer. As regards the latter type of disease, the first recorded case was by Rayner D. Batten (*Trans. Ophthal. Society U.K.*, Vol. XVII, 1897, p. 48), and since then instances have been reported by G. F. Still and D. Gunn (*Ibidem*, Vol. XX, 1900, p. 108), F. E. Batten (*Ibidem*, Vol. XXIII, 1903, p. 386), Hirschberg (*Centralbl. f. prak. Augenheilkunde*, Januar, 1904), M. S. Mayou (*Trans. Ophthal. Society U.K.*, XXIV, 1904, p. 142), R. Hutchison (*Reports of the Society for the Study of Disease in Children*, Vol. IV, 1904, p. 112), and the reviewer (*Ibidem*, Vol. V, 1905, p. 25).

Nettleship's idea appears to be that if the last-named cases had been examined earlier in life, changes similar to those characteristic of Tay-Sachs' disease might have been found in the eyes. To the obvious objection that babies suffering from amaurotic family idiocy usually die within one year from the discovery of the disease, Nettleship points out that there are already a few exceptions (Koller, Freud, and Peterson) to what is undoubtedly the general rule. Even in those cases, however, the ophthalmoscopic picture drawn by the various authors does not agree exactly with the appearances described in some of the other cases, although undue stress should not be laid upon this point, inasmuch as the descriptions are not very full.

It is obvious that the Tay-Sachs' disease and the other conditions agree in several points—as, for example, that both are family affections, that signs of cerebral degeneration are present, and,

lastly, that both are associated with central ophthalmoscopic changes, with pallor of the optic discs, and with amblyopia. On the other hand, the two conditions differ from one another in several particulars, of which perhaps the most striking are: the practical limitation of Tay-Sachs' disorder to the offspring of Jewish parents, the age of the patients (usually the third to the sixth month of life), the absence of inherited syphilitic taint, and, finally, the early death of those who suffer from amaurotic family idiocy. Nettleship suggests in a tentative sort of way that, after all, the differences between the groups "may be superficial, depending upon the stage or the degree of the morbid process, whilst the resemblances may possibly be fundamental." His point is that if children affected with the Tay-Sachs' disease did survive the infantile stage and were examined with the ophthalmoscope when a few years old, then some such appearance as that found in the other class of case might possibly be discovered. There would also be, as a matter of course, more or less marked mental deficiency. Nettleship suggests that all these forms of central retinitis in infancy and childhood may be the outcome of blood poisoning of one kind or another. The long course pursued by the Tay-Sachs' malady is not necessarily inconsistent with this theory. A toxic cause might act either before or after birth. In the latter event, the infant's food *—that is, usually the mother's milk—might be responsible. Before ascribing the disease to the influence of race, as such, Nettleship suggests that investigations should be made into the food used by the poorer class of Jewish mothers whilst pregnant and suckling, and also into that of their babies for some months after weaning.

Nettleship describes at some length thirteen cases in patients whose ages ranged from $11\frac{1}{2}$ to 53 years (average 30·7 years), and of whom 10 were males and 3 were females. This group of cases showed the following points more or less in common:—1. Occurrence in patients believed on more or less adequate evidence to be of Hebrew parentage; 2. absence of obvious syphilitic taint; 3. weak-mindedness either in the patient or in one or several members of the same family; 4. the influence of measles, varicella, or other nutritional disturbance of a general nature in determining the ocular condition; 5. the existence of colour blindness, of day blindness, or of dislike to bright solar light; 6. fulness of the visual fields for white; 7. amblyopia, changes at the yellow spot, and optic atrophy. It will be noticed that the family predisposition to disease, so marked in the Tay-Sachs' and in the other condition, is not a pronounced feature of Nettleship's group.

SYDNEY STEPHENSON.

* That something in the child's food may determine the degeneration was suggested some years ago by Risien Russell and L. C. Kingston in an important monograph on amaurotic family idiocy.—S. S.

(2) **Stock,** in an important paper, deals with the clinical and pathological aspects of retinal degeneration in four children, three boys and a girl, the offspring of a non-consanguineous marriage. The father gave a doubtful history of syphilis. The children were all healthy up to the time of the second dentition, when idiocy and amblyopia set in simultaneously. Mayou's case is referred to in this connection. The ophthalmoscope showed pigmentary degeneration of the retina in the boys; the girl, although completely blind, had a practically normal fundus, so that the diagnosis, subsequently verified, was retinal degeneration without pigment. The eyes of the girl and of two of her brothers, who succumbed to phthisis pulmonalis, were examined microscopically. Very characteristic changes were found. It appears that the pathological process in this group of cases consists in primary degeneration of the rods and cones, followed by secondary disturbance of the pigmentary epithelium. The pigment cells partly degenerate, partly immigrate into the retina, where they are taken up by glia cells or found inside the sheaths of obliterated blood-vessels. The inner nuclear layer, the optic nerve, and choroid remain perfectly normal; the ganglion cells exhibit slight structural changes, without undergoing degeneration. The author had the opportunity of examining for comparison an exceptionally fresh and well-prepared specimen of retinitis pigmentosa. He found, again, a practically normal choroid and retinal changes as before; but, in addition, there was pronounced atrophy of the optic nerve and degeneration of the ganglion cells and inner nuclear layer. Stock proposes the name of "amaurotic family dementia" for his cases, which he distinguishes sharply from Tay's infantile retinitis, on the one hand, and typical retinitis pigmentosa in congenital idiocy, on the other. C. MARKUS.

X.—THE OCULAR TYPHOID REACTION.

Hamburger, Walter W.—The ocular typhoid reaction. Preliminary report of a modification of the ocular test of Chantemesse. *Journal American Medical Association,* April 25th, 1908.

Hamburger's observations, made with the hope of confirming the results of Chantemesse, were obtained by the use of a typhoid extract prepared in a much simpler way. The bacteria were grown on plain agar-slants for twenty-four hours. They were then washed from the surface with an ordinary salt solution, and an emulsion which contained 3,000,000,000 bacilli in each cubic centimeter was obtained and placed in an incubator at 37·5° C. for a period of four days. The bacteria were then removed by prolonged centrifugation and the supernatant almost clear fluid was withdrawn and heated to 60° C. for thirty

minutes. This fluid, which was used for the tests, was sterile; no bacilli being found in stained smears. The usual precautions as to cleanliness, care in instillation, etc., were observed during the procedure.

The test was tried in forty-eight cases. Twenty-seven of them, which had been diagnosed clinically as typhoid fever and gave positive agglutination tests or a blood culture, reacted positively. Fifteen control patients, suffering clinically from a variety of other maladies, failed to react. Six cases, which had been diagnosed clinically as typhoid fever, but did not present either positive agglutination reaction or blood culture, gave two positive results.

The positive reactions obtained in the proved cases presented a number of interesting features. The stage of the disease did not bear any striking relation to the degree of the reaction except in some instances suggesting a possible increase in intensity during the active process of the infection. In no cases was it possible to obtain an ocular reaction prior to the agglutination phenomenon, although regarding this point, the author intends to make further observations. The earliest reaction was evident after an incubation period of three hours. Six cases that were examined six hours after instillation were all positive. The duration of the reaction averaged from forty-eight to seventy-two hours, the limits ranging from twenty-four to ninety-six hours.

The author describes a typical reaction as follows: from three to six hours after an instillation a diffuse redness of the caruncle, plica semilunaris, and palpebral conjunctiva appeared. At the end of this period (or a little later) a yellow-white, translucent, mucopurulent discharge collected at the inner canthus. Frequently the patient complained that the "eye was stuck together on awakening" the day following. In such cases there were evidences of a dried exudate situated on the lid margins and among the lashes. No subjective symptoms, other than "a watering of the eye," or "a smarting" or "a soreness," were complained of.

The author states that if there is any doubt as to the existence of a reaction, special study of the portion of the conjunctiva covering the lower and outer fornix of the tested eye should be made, as he has noticed that it is the point at which the greatest injection occurs. He has also found that comparison with the other eye may be useful in deciding doubtful cases.

In brief, he says that by the instillation of one drop of an extract of the typhoid bacillus into the conjunctival sac of typhoid patients, a reactive inflammation, which is probably specific and possibly universal, is produced. In diseases other than typhoid, a less intense and more brief reaction, which in most cases may easily be differentiated, occasionally appears. These results agree closely with those that have been obtained with the alcoholic precipitate employed by Chantemesse. CHARLES A. OLIVER.

XI.—TENONITIS.

(1) **Jocqs. — Metastatic suppurative tenonitis : Ocular metastases.** (**Ténonite suppurée métastatique : Métastases oculaires.**) *L'Ophtalmologie Provinciale*, juillet, 1905.

(2) **Terson, Père and Terson, J.—Bilateral serous tenonitis with monocular exophthalmos.** (**Ténonite séreuse bilatérale avec exophtalmie monoculaire,**) *Ann. d'oculistique*, T. CXXXVIII, p. 402, décembre, 1907.

(1) **Jocqs** (Paris) records a case in which a patient suffering from retention of urine, with vesical catarrh, who developed quiet inflammation of the uveal tract of one eye, causing blindness, and many years later, had a fresh attack of uveitis followed by acute ocular complications and terminating in suppurative tenonitis. He calls attention to the connection in the female between quiet irido-choroiditis and menstrual disorders, and suggests that similar cases in the male for which no other cause can be found may depend on disease of the genito-urinary organs. R. J. COULTER.

(2) The **Tersons'** patient, a woman, aged 49, had infection of both conjunctivæ without discharge, and in addition in the right eye exophthalmos with diminished movements, causing diplopia, marked œdema of the upper lid, chemosis, dilatation of the retinal veins, and reduction of vision to $\frac{1}{4}$, with hypermetropia 0·75 D. The case was diagnosed as one of serous tenonitis, and treated with salicylate of soda without benefit for a week, when multiple incisions, made in the conjunctiva and repeated after an interval of two days, were followed by rapid improvement, the patient being discharged cured a week later. Two months afterwards, the patient was quite well, the vision being normal and the refraction emmetropic.

R. J. COULTER.

XII.—LIPÆMIA RETINALIS.

Heine, L.—On lipæmia retinalis and hypotonia bulbi in coma diabeticum. *Klin. Monatsbl. f. Augenheilkunde*, November-Dezember, 1906.

Hypotonia bulbi is, according to **Heine**, of frequent occurrence in diabetic coma. He missed it in one only out of 22 cases. On the other hand, lipæmia in diabetic patients is a rare condition, of which the earliest diagnosis is made by the aid of the ophthalmoscope. The changes characteristic of this condition were found in a patient, aged 17, six days before death took place in coma. The retinal arteries and veins were somewhat

dilated, and appeared to be filled with milk instead of blood. The optic disc and choroid retained their normal colour. The blood was examined as a result of the ophthalmoscopic finding, and found to contain 8 per cent. fat. In a second case, in which the discolouration was only slight, the blood-analysis gave 4 per cent. fat. Heine discusses the point that, contrary to what should be expected, the blood withdrawn from the patients retains its normal colour. C. MARKUS.

XIII.—INTERSTITIAL KERATITIS DUE TO ACQUIRED SYPHILIS.

Fisher, J. Herbert.—**Some cases of interstitial keratitis from acquired syphilis.** *Trans. Ophthal. Society* U.K., Vol. XXVIII, fasc. 1, 1908.

Fisher (London) gives particulars of four cases of interstitial keratitis due, in his opinion, to acquired syphilis. Essential facts follow: 1. Female, aged 36 years, contracted syphilis about fourteen years before her left eye became inflamed. Interstitial keratitis, invading the lower nasal quadrant of one cornea; no "salmon-patch." Iris free from adhesions. Treatment by potassium iodide, ten grains thrice a day. Some six months later, faint nebula, which scarcely encroached upon the pupillary area of the cornea. 2. Male, 33 years, suffering from disseminated choroido-retinitis of each eye, and also from patchy infiltration and haze of the left cornea. The former condition had supervened about five, and the latter about nine, years after the patient had acquired syphilis. 3. Male, aged 28 years, developed a partial interstitial infiltration of the right cornea about three years after the primary sclerosis. The left fundus oculi showed recent choroido-retinitis. Fourteen days later, opacities in vitreous of right eye, together with detachment of retina in nasal periphery of same eye. 4. Male, aged 33 years, interstitial keratitis, with a "salmon-patch" of left eye, five years after primary syphilis. In addition to the foregoing cases, given in briefest abstract above, Fisher mentions two others, one already described by Lawford and himself in the twentieth volume of the *Transactions*, and the other following a few months after a primary chancre on the mucous membrane of the lower eyelid.

Fisher concludes that keratitis is usually a very late secondary or a tertiary manifestation of acquired syphilis, except when the primary lesion has affected the appendages of the eye, as the conjunctiva; that it attacks, as a rule, one eye alone; that the entire cornea is seldom involved, and that vascularisation is common; and, finally, that apart from distribution, the

keratitis of acquired and of inherited syphilis cannot be differentiated from one another. The remainder of Fisher's communication, which includes a description of a case of interstitial keratitis in both mother and child, is occupied by a discussion as to the possibility of the transmission of syphilis to the third generation. SYDNEY STEPHENSON.

XIV.—THE ELECTRO-DIAGNOSIS OF OCULO-MOTOR PARALYSIS.

Salomonson, Professor (Amsterdam).—Electro-diagnosis of oculo-motor paralysis. *British Medical Journal*, September 14th, 1907.

In healthy persons it is not possible to test the ocular muscles electrically. In some cases of paralytic ptosis it is possible to get a contraction, by the galvanic current only, of the levator palpebræ superioris. Such cases are those in which there is reaction of degeneration, and in which the motor point is displaced from far back in the orbit to the tarsal expansion. Since reaction of degeneration implies a nuclear or peripheral lesion, the sign is of importance from a diagnostic standpoint. As to prognosis, decreasing excitability means commencing regeneration of the nerve. In applying the test the current strength may be from 1 to 3 milliamperes, and the electrode should be a small brass 5 mm. button covered with moistened cloth and applied a few millimetres beneath the centre of the eyebrow. The effect consists of a slight lifting of the eyelid, a few millimetres at the utmost. ERNEST THOMSON.

XV.—THE LIGHT SENSE IN STRABISMUS.

Mackay, D. Matheson.—The light sense in strabismus, especially in the amblyopia of strabismus. *Transactions Ophthalmological Society U.K.*, 1906.

Mackay (Hull), in order to find whether there is any defect in the light minimum or light difference in strabismic eyes such as would point to an affection of the choroid, retina, or optic nerve in accordance with Bjerrum's dictum, examined with his own photometer 125 cases, including: (1) convergent strabismus with amblyopia; (2) ditto without amblyopia; (3) alternate ditto with double amblyopia; (4) divergent strabismus with amblyopia; (5) ditto without amblyopia; (6) amblyopia without strabismus. It is not necessary to go into the details, which show, in the writer's own words, that "they do not reveal any obscure lesion of the optic nerve or retina or choroid, so that from them one can only deduce that the condition of the light sense is not responsible for the squint or for the amblyopia."

ERNEST THOMSON.

XVI.—THE CORNEA IN MULTIPLE SCLEROSIS.

Salus.—Greenish discolouration of the cornea in multiple sclerosis. Grünliche Hornhautverfärbung bei multipler Sklerose.) *Medizinische Klinik*, 5 April, 1908.

Salus, in a case of multiple sclerosis, was struck by a brownish discolouration of the cornea, which was brought into prominence by contrast with a bright-blue iris. On closer examination, he found in the deep and deepest layers of the border zone of the cornea, a very fine punctate deposit, which appeared red-brown or green according to the direction from which it was observed. (Coloured illustration.) In R.E. a yellow-brown pinguecula discolouration was present in the palpebral fissure, with two red-brown flecks near its lower border. The cornea was normally formed, smooth and shiny, and its sensibility was intact. The abnormality was perfectly symmetrical in both eyes. Ophthalmoscopically, the eyes were normal. Vision normal, refraction emmetropic. On extreme movements of the eyes, nystagmus. During two months observation, no change was observed in the cornea, but the brown flecks in the pinguecula disappeared. Some years previously, the case had been twice examined, and no abnormality in the cornea found. It was not, therefore, a congenital condition. No history or sign of traumatism was to hand which might suggest hæmorrhage as a cause of the discolouration ; its ring shape and presence in both eyes also discount this as an explanation. Staining from aniline gives a completely different pathological picture. The patient's general condition was good, and, therefore, malnutrition can be excluded from the ætiology.

Three other cases have been reported—one by Kayser, who observed no change in the corneal condition during about a year, and two by Fleischer. All four cases were associated with disease of the nervous system, *viz.*, three with multiple sclerosis, one with pseudo-sclerosis. The disease had lasted, in Kayser's case, five years ; in Fleischer's cases, two or three years and "some years" ; and in the author's case, sixteen years.

Since there was no trace of any damage to Descemet's membrane in Salus' case, he considers that the pigment cannot have come from the anterior chamber. Nor could the pigment have come from the ciliary loops, since the superficial layers of the cornea were clear. Salus thinks it probable that blood has slowly and gradually filtered from Schlemm's canal by reason of changes in the innervation of its wall, which is composed of a single layer of endothelial cells, and is thus more readily damaged than the walls of an ordinary blood-vessel. The brown flecks in the pinguecula were probably also due to a blood leakage. The author thinks the condition may have been missed in other cases, where the iris was brown, especially as, in these cases, ophthalmoscopic examination is directed chiefly to the condition of the fundus. ROSA FORD.

XVII.—INFECTIONS OF THE CHOROID.

(1) **Rollet and Aurand. — A comparative experimental study on tuberculosis and aspergillary pseudo-tuberculosis of the choroid. (Etude expérimentale comparée sur la tuberculose et la pseudo-tuberculose aspergillaire de la choroïde.)** *Revue générale d'ophtalmologie*, 31 janvier, 1907.

(2) **Rollet and Aurand.—Experimental researches on infections of the choroid. (Recherches expérimentales sur les infections de la choroïde.)** *Revue générale d'ophtalmologie*, 31 janvier, 1908.

(1) In the course of their researches on aspergillary keratitis, **Rollet and Aurand** (Lyons) were much struck with the resemblance which the nodular form of this disease in the cornea and iris bore to true tubercles. Bearing also in mind the fact that in man pulmonary aspergillosis caused by *aspergillus fumigatus* quite resembles pulmonary tuberculosis and is called aspergillary pseudo-tuberculosis, they considered that it would be interesting if this analogy could be traced in intra-ocular lesions, and especially in lesions of the deep membranes of the eye. The experiments on rabbits undertaken by the authors are given at very considerable length, and even their conclusions are rather long to quote in full. The following are the chief points :—(1) Experimental tuberculosis of the choroid occurs either as miliary tuberculosis or as disseminated chorio-retinitis. The latter is the rarer form, and is non-bacillary, toxic, and benign ; (2) experimental pseudo-tuberculosis of the choroid is always miliary and quite similar in appearance to true tuberculosis ; (3) both are chronic and insidious, but true tuberculosis develops more slowly than pseudo-tuberculosis of the choroid ; (4) true tuberculosis of the choroid may extend forwards to the anterior part of the uveal tract ; aspergillosis does not appear to do so ; (5) experimental tuberculosis of the choroid may cause death of the rabbit by extension to viscera; pseudo-tuberculosis does not appear to do so ; (6) both may, on the other hand, become cured, leaving visible scars, those of aspergillosis being less marked than those of tuberculosis ; (7) inoculation of the vitreous with tubercle does not seem to cause a greater effect than direct inoculation of the choroid. On the other hand, inoculation of the vitreous with *aspergillus* is much more severe than inoculation of the choroid direct, and leads to irido-choroditis, retinitis, and secondary cataract with, sometimes, atrophy of the globe. Details well worth studying in the original paper. ERNEST THOMSON.

(2) **Rollet and Aurand** (Lyons) have followed up their investigations of a year ago upon tuberculosis and pseudo-tuberculosis of the choroid by further work on the same lines with the micro-organisms of actinomycosis, leprosy (*Hansen's bacillus*), thrush, typhoid fever (*Eberth's bacillus*), influenza (*Pfeiffer bacillus*), and with *bacillus coli communis*. Their experiments have been on the same lines as before, namely, one series in which direct inoculation of the choroid of the rabbit is employed, and another in which the vitreous is inoculated. In the first series all the results were negative except that *actinomyces* gave a focus of generalisation in the liver without any specific choroidal lesions. In the second series, inoculations with *actinomyces* and *Pfeiffer's bacillus* were negative. *Hansen's bacillus* provoked very quickly a septic hyalo-retino-choroiditis of chronic course with dystrophic cataract. At the end of a month and a half there was no generalisation of the disease. *Oidium albicans* rapidly caused lesions of the choroid and retina. These lesions appeared as snowy-white, rounded nodules with soft edges, and spread readily from above downwards on the choroid and retina, becoming covered with new-formed vessels. The appearance of the nodules was like that of Aspergillosis of the choroid, but larger, more prominent, and more numerous than in that affection. Further, thrush developed quicker than aspergillosis (5 days compared with 25), was less virulent in so far as it did not produce irido-choroido-retinitis with hyalitis and dystrophic cataract, and did not generalise. *Eberth's bacillus* only caused a benign form of choroiditis and did not generalise. *Bacillus coli communis*, at the end of six days, caused a septic retino-choroiditis and hyalitis, followed by dystrophic cataract at the end of two months. Seven months later, there was no generalisation, which corresponds with the known resistance of the rabbit to this micro-organism. ERNEST THOMSON.

XVIII.—INJURIES OF THE EYE FROM LIGHTNING.

Hilbert.—A contribution to the knowledge of eye injuries from a stroke of lightning. (**Zur Kenntnis der Augenverletzungen durch Blitzschlag.**) *Wochenschrift f. Therapie und Hygiene des Auges*, 27 Februar, 1908.

Hilbert (Sensburg) observed two cases of different types of eye injuries occurring in telegraph officials who were struck at the same time by lightning breaking into the telegraph circuit. Both patients were of middle-age and somewhat corpulent.

The first described the effect as if the whole field of vision were filled by a blinding, surging sea of fire. Vertigo and headache followed, but after resting awhile he went home. After going to bed and falling asleep, he was awakened by violent pains in the head and the eyes. Upon examination, the pupils were found to be widely dilated, and scarcely reacted to light; the corneæ steamy, and the eyeballs of a stony hardness. Treatment with physostigmine relieved the condition, and the patient returned to work in three weeks.

The other patient felt at the instant of the occurrence as if the entire room was in flames; and experienced lightning pains running down the vertebral column from the head. At the same time he became unconscious, but came to himself in eight or ten minutes, and was removed to his house. Next day he complained of pains in the head and throughout the body, and vomited several times. There was a moderate degree of conjunctivitis with lacrymation and a sensation of blindness. Otherwise, the eyes were normal. While the other symptoms disappeared in the course of a few days, the pains throughout the body continued for some weeks, and were regarded as a form of traumatic neurosis produced by the stroke of lightning. Two horses were struck about the same time and on examination ten days afterwards, both were blind and the optic nerves were perfectly white.

The author gives a review of the reported cases of affections of the eyes due to stroke by lightning or from a strong electrical current. Cataract appears to be the most frequent, and is followed in importance by optic neuritis and optic atrophy. Less frequent are corneal affections, paralyses of various nerves, conjunctivitis, ecchymosis, œdema of the lids, and hæmorrhages into the anterior chamber or the vitreous, iritis, and irido-cyclitis.

W. B. I. POLLOCK.

XIX.—TREATMENT.

(1) **Gendron.—The pathogeny and treatment of phlyctenular ophthalmia.** *L'Ophtal. Prov.*, octobre, 1906.

(2) **Davis, A. Edward.—Diet as a therapeutic measure in certain eye diseases.** *Dietetic and Hygienic Gazette*, 1907, p. 144.

(3) **Vassiliadès.—On the use of brushes in ocular therapeutics.** *L'Ophtal. Prov.*, août, 1907.

(4) **Guillery.—On corneal opacities produced by the caustic effects of certain metallic poisons, together with an account of an improved method of clearing them up.** *Arch. f. Augenheilkunde*, September, 1907.

(5) Fernandez.—The treatment of cataract by potassium iodide. *Annales de Oftalmologia*, November, 1907.

(6) Fox, L. Webster.—The radical cure of vernal conjunctivitis. *Pennsylvania Medical Journal*, December, 1907.

(7) Galtier.—A short note on the subconjunctival injection of Chinese ink in the eyes of albinos. *Annales d'Oculistique*, février, 1908.

(8) Brav, Aaron.—The rational treatment of iritis. *New York Medical Journal*, February 22, 1908.

(9) Windmüller.—On instillations of fibrolysin into the conjunctival sac. *Medizinische Klinik*, März 1, 1908.

(10) The incompatibilities of organic salts of silver. *Lancet*, March 14, 1908.

(11) Egbert, J. Hobart.—Trachoma: clinical aspects and successful treatment. *New York Medical Journal*, March 21, 1908.

(12) Gillman, Robert W.—The use of jequirity in trachoma. *Journ. Ophthal. and Oto-Laryngology*, March, 1908.

(12A) Frenkel.—On the therapeutic value of subconjunctival injections of sterilised air. (Valeur thérapeutique des injections sous-conjonctivales d'air stérilisé.) *Ann. d'Oculistique*, T. CXXXIX, p. 182, mars, 1908.

(13) Faith, Thomas.—Papilloma of the conjunctiva, with report of a case successfully treated with the X-ray. *Journ. Ophthal. and Oto-Laryngology*, April, 1908.

(14) Ellett, E. C.—The treatment of iritis. *Journ. Amer. Med. Association*, April 4, 1908.

(15) Ellis, H. Bert.—Treatment of ulcers of the cornea. *Journ. Amer. Med. Association*, April 4, 1908.

(16) Prince, A. E.—Treatment of chronic trachoma. *Journ. Amer. Med. Association*, April 25, 1908.

(16A) Caralt.—The value of injections of sterilised air in ocular therapeutics. (Las inyecciones subconjunctivales de aire esterilazado en terapeutica ocular.) *Archivos de Oftalmologia Hispano-Americanos*, Abril, 1908.

(17) v. Colditz, G. Thomsen.—Unusual constitutional effects of atropine solution in the eye. *Journ. Ophthal. and Oto-Laryngology*, May, 1908.

(18) Spalding, J. A.—Camphor water and cherry-laurel water in collyria. *Archives of Ophthalmology*, May, 1908.

(19) **Galezowski, J.**—Treatment of corneal opacities by thiosinamine. (Traitement des taies de la cornée par la thiosinamine). *Soc. franç. d'ophtalm.*, mai, 1908, and *Rev. générale d'Ophtalmologie*, 31 mai, 1908.

(20) **Pollak, A.** — A painless method of injecting thiosinamine. *Wien. med. Wochenschrift*, Februar 15, 1908.

(21) **Cantonnet, A.**—The advantages of a saline solution isotonic with the tears as an eye-wash (Solution chlorurée isotonique aux larmes pour lavages et bains de l'œil.) *Archives d'Ophtalmologie*, mai, 1908.

(22) **Chesneau, Marcel.** — Subconjunctival injections of air. (L'emploi thérapeutique des injections sous-conjonctivales d'air.) *Annales d'Oculistique*, mai, 1908.

(23) **Wray, Charles.** — Case of follicular conjunctivitis showing the result of a special method of treatment; one eye treated, the other left untouched. *Trans. Ophthal. Society* U.K., Vol. XXVIII, fasc. 2, 1908.

(1) **Gendron** after discussing the theories which have been advanced as to the nature of phlyctenular ophthalmia, states his opinion that the disease is the result of an irritative process caused by modifications in the composition of the blood-serum produced by scrofulo-tuberculosis, physiological debility, arthritism, hereditary syphilis, or alcoholism. R. J. COULTER.

(3) **Vassiliadès**, of Beyrouth, calls attention to the difficulty of rendering brushes aseptic, and recommends that cotton wool, wrapped on the end of a glass rod, should be substituted for them. R. J. COULTER.

(4) **Guillery's** paper deals with the feasibility of clearing up corneal opacities produced by caustic substances. The author has found by experiment that opacities due to lead are improved most with ammonium chloride and tartrate; copper with ammonium chloride, tartrate, and acetate; silver with sodium thiosulphate. As regards silver, however, the results in the case of the living eye are disappointing. Opacities caused by barium hydrate cannot be influenced in any way. They differ, also, from the opacities caused by the other metals, in that none of the characteristic chemical reactions of barium can be obtained in the tissues. On the whole, Guillery's results are encouraging.
PERCIVAL J. HAY.

(5) **Fernandez** concludes that the subconjunctival injection of potassium iodide has no appreciable effect on the course of the evolution of cataract. HAROLD GRIMSDALE.

(6) From an experience of twelve years with the operative procedure of Jocqs,* **Fox** is convinced that the sooner this operation is performed after a diagnosis has been positively established, the quicker is a permanent cure obtained. If the

* For abstract see THE OPHTHALMOSCOPE, 1907, p. 220.

disease has run a long course, he has recourse to a more extensive tarsectomy. In cases refusing radical treatment, he employs two drops of a solution made of ten drops of acetic acid to four fluid ounces of distilled water, three times daily; adding five drops each day until a smarting sensation is produced. Chinosol, chlorine water, and dionin powder, as suggested by Pyle, may be additionally used in order to give temporary relief. C. A. OLIVER.

(7) In the hope of diminishing the diffusion of light through the sclerotic, **Galtier** has treated an albinotic patient with subconjunctival injections of Chinese ink, with the result that the sclerotics were stained a bluish-white colour, which was by no means disfiguring, but resembled that which is seen in eyes with thin sclerotics. To obtain good results from the method, he considers that, in addition to the subconjunctival injection, a peripheral band of the cornea, 3 or 4 mm. wide, should be tattooed, so as to prevent as much light as possible from diffusing through the iris. R. J. COULTER.

(9) **Windmüller** (Eberswalde) having failed to influence an opacity of the cornea caused by lime by the intramuscular injection of fibrolysin, tried the local application of this curious product. Since June, 1907, he has employed fibrolysin in this way in the treatment of various affections of the eye. The best results have been obtained in corneal opacities, whether of inflammatory or non-inflammatory origin. The remedy should not be used until all inflammatory signs have disappeared. The fibrolysin is applied one to three times a day, the resorptive powers of the eye having first been enhanced by the application of dionin (2 per cent. to 10 per cent., gradually increased). Slight stinging pain is the immediate result of the application, but rapid blinking speedily removes any discomfort. Fibrolysin, in Windmüller's experience, causes a disappearance or a reduction of the corneal opacity, and in some cases, an improvement in sight. The æsthetic gain in the patient's appearance is sometimes very marked. The fibrolysin, which is now put up in drop bottles by Merck (Darmstadt), should be used fresh.

SYDNEY STEPHENSON.

(10) "In the *Repertoire de Pharmacie* Dr. V. Demandre deals with various substances which are incompatible with argyrol (silver protein). Argyrol is decomposed by light and is attacked by hydrochloric acid. Alkaline chlorides yield with argyrol a precipitate of silver chloride. The hydrochloride of pilocarpine should never be prescribed with argyrol owing to the formation of a brown precipitate; the nitrate of pilocarpine, however, does not decompose argyrol. The addition of adrenalin to argyrol in solution leads to similar changes to those produced in the case of hydrochloric acid. Cocaine hydrochloride in solution is immediately and completely decomposed by argyrol and the same result is obtained with the sulphate of copper and zinc. Argyrol is

decomposed by several other compounds, including the hydrochlorides of morphine, heroin, quinine, cinchonine, and sparteine. Both argyrol and protargol may be prescribed with the hydrochlorides of cocaine, tropacocaine, alpha eucaine, holocaine, and neroanine if these substances are dissolved in a 1·5 per cent. aqueous solution of boric acid. These observations respecting two of the important organic compounds of silver will probably be found useful in the case of others of this class."

(11) **Egbert** has devised a sharp and a blunt curette for the opening and the emptying of granules and the removal of hyperplastic material. They are so constructed that all of the involved portions of the conjunctiva can be reached, and all of the granular and hyperplastic tissue removed with but little danger to the healthy structures. In long-standing cases, he supplements their use by massage of the lid-tissues by rubbing the conjunctival surfaces, which are kept flushed during the procedure, with smooth glass spatulas. C. A. OLIVER.

(12) **Gillman** (Detroit) believes that the use of "this cunning and miraculous Oriental plant"—in plain English, jequirity—is not so widely spread as, in his opinion, it deserves to be. "After fifteen years' experience with it," he says, "I never cease to wonder at its marvellous working in certain eyes." The remedy, however, should be used in selected cases only. Gillman first employs the 2 per cent. to 5 per cent. infusion, and, later, if need be, the powdered jequirity. From eight to twenty applications usually suffice to cause a curative ophthalmia. Symptoms disappear in twenty-four hours after discontinuing the jequirity. Two successful cases are reported. Jequirity is recommended by Gillman in: (1) eyes more or less blinded by pannus; and (2) very chronic cases of trachoma, without corneal complications, which fail to improve under milder remedies. Patients who are undergoing the jequirity treatment should be seen by the attending oculist at least once or twice a day.

SYDNEY STEPHENSON.

(12A) **Frenkel,** following the example of the Tersons, has used subconjunctival injections of air largely in the treatment of various diseases of the eye. He gives a table showing the results obtained in 51 carefully noted cases which had previously been unsuccessfully treated by the ordinary methods for periods varying from three days to six months. These were satisfactory in eight cases of phlyctenular keratoconjunctivitis, one case of fascicular keratitis, seven cases of corneal abscess (five healing rapidly and two slowly), six out of seven cases of central corneal ulcer, four out of seven cases of marginal corneal ulcer, and seven cases of corneal ulcer with pannus. In four cases of hypopyon-ulcer, three cases of interstitial keratitis, and one case of syphilitic scleritis, the improvement was less marked, although the treatment appeared to have a favourable influence on the diseases. In tuberculous disease of the eye the effect of sub-

conjunctival injections of air is probably similar to that of injections of air in tuberculous pleurisy or peritonitis. In other cases Frenkel suggests that their therapeutic action is due to 1. relief of pain from (a) stretching or (b) compression of the terminal filaments of the fifth nerve; 2. stimulation of the leucocytes by the oxygen; 3. stimulation of trophic nerve fibres. Finally, Frenkel is of opinion that in competent hands subconjunctival injections of air are harmless, and owing to simplicity of *technique* are likely to be largely used, that they are most valuable in superficial affections of the anterior segment of the eye, that their action is symptomatic rather than specific and requires to be supplemented by other therapeutic measures, that they are especially efficacious in relieving pain, and, lastly, that they should be regarded as intermediate in intensity between mercurial ointments and injections of saline solution or cyanide of mercury. He recommends that the injections should be given every three days, and that if the desired effect is not produced in a fortnight, the treatment should be altered.

R. J. COULTER.

(16A) **Caralt** has made use of subconjunctival injections of sterile air in many ocular maladies. He believes the action to be due to an increased leucocytosis, set up by the presence of oxygen in the subconjunctival tissues, and feels justified in making the following conclusions:—

1. These injections are harmless, painless, analgesic, and remove adhesions of the subconjunctival space. They stimulate leucocytosis, and hasten the removal of the products of inflammation.

2. They have little or no antiseptic power, and are therefore inferior, in presence of virulent infection, to the injections of mercurial solutions.

3. Their lymphagogic and osmotic power is less than that of injections of sodium chloride, and the latter should be used in intra-ocular infections.

4. In scleritis, and sclerosing keratitis, and also in tuberculous and filamentary keratitis, they are the treatment of election.

5. They seem to be specific in tuberculous iritis.

6. They are the best treatment known in hypertrophy of the limbus in spring catarrh, and bullous keratitis dependent on herpes or traumatism.

7. They are of value as an adjuvant method in various forms of ulcer.

HAROLD GRIMSDALE.

(17) **v. Colditz** (Chicago) reports the case of a little girl, 8 years of age, who developed dizziness, a peculiar taste in the mouth, emesis, hallucinations, and nocturnal delirium a few hours after one drop of a 1 per cent. solution of atropine had been applied to each eye.

SYDNEY STEPHENSON.

(18) **Spalding** (Portland, Me.) has found that some of his patients complain of the irritating nature of lotions compounded with camphor water or with cherry-laurel water. His enquiries lead him to believe that the fault lies with the chemist, hardly any two of whom make the menstrua in question in exactly the same way. SYDNEY STEPHENSON.

(19) The employment of solutions of thiosinamine in 5 per cent., 10 per cent., or 15 per cent. concentration, has yielded in **Galezowski's** hands very favourable results in the treatment of opacities of the cornea. Among 26 such cases there was in 9 a notable amelioration, and in 11 a sensible improvement. In the remaining six cases the condition remained without appreciable alteration. The treatment gave good results, even in the case of corneal opacities which dated from 15 and 25 years. The aqueous solution of thiosinamine obtained by adding that substance to antipyrine is always well borne by the patient. Galezowski employs that solution by means of an eye bath for five minutes once or twice a day. J. GALEZOWSKI.

(20) **Pollak** maintains that thiosinamine may be injected without causing pain, provided the following solution be employed: thiosinamine, 1; glycerine and distilled water, of each, 5. Of this solution 1 cm. may be injected five or six times every week. SYDNEY STEPHENSON.

(21) **Cantonnet** (Paris) after discussing recent work with regard to "osmonocivity"—*i.e.*, the mischief done to the tissues by the osmotic disturbances caused by the molecular constitution of a solution—and "toxolysis"—*i.e.*, the harm produced by the chemical or biological properties innate to the solution employed—points out that the total nocivity of a particular liquid is represented by the sum of the two factors mentioned. A liquid suitable for use in eye work must be neither toxic nor "osmonocif." It should, in fact, be isotonic with the tears. Cantonnet's experiments lead him to conclude that such a solution is to be found in saline, containing 14 grammes of sodium chloride to a litre of distilled water—that is, a 1·4 per cent. solution. A good example of a harmless wash for the eyes is to be found in boric acid lotion (2·5 per cent.), which is scarcely toxic, and in the strength named is isotonic with the lacrymal secretion. On the other hand, another popular lotion, *viz.*, oxycyanide of mercury (1 : 5,000), possesses a molecular concentration which differs appreciably from that of the tears. The saline solution recommended by Cantonnet, as he recognises, is not a powerful antiseptic. Its chief use will be found not in destroying, say, the germs of a severe infective inflammation of the conjunctiva, but, rather, as an aseptic wash devoid of irritating qualities when used to the eye before and after operations. It has one advantage over boric lotion in the fact that its reaction is not acid, so that it does not interfere with the alkalinity of the lacrymal secretion. SYDNEY STEPHENSON.

(22) Following the example set by Koster, Dianoux, Félix, and the Tersons, **Chesneau** (Nantes) has tried what therapeutic effects could be achieved by injecting air beneath the conjunctiva. One of the most remarkable results of the injections is to be found in the rapid cessation of photophobia and pain in many cases belonging to the type of herpes corneæ. A similar remark applies to recurrent keratalgia. Injections also yielded good results in iritis, the corneal complications of acute conjunctivitis, phlyctenular keratitis, zonular opacity of the cornea, scrofulous pannus, and atonic ulcerations of the cornea. Chesneau has twice seen an abundant ecchymosis beneath the conjunctiva follow the injections, but no other complications have been observed. In order to avoid the introduction of micro-organisms, Chesneau brings a platinum needle to a red heat, and then when it has become dull-red, or is still very hot, punctures the conjunctiva, which is thereby sterilized at the point of perforation. SYDNEY STEPHENSON.

(23) **Wray** (Croydon, London) treated a case of follicular conjunctivitis as follows: after induction of local anæsthesia, the follicles were crushed, 20 per cent. argyrol was instilled, and this was followed by adrenalin, 1 : 1000, in order to fix the argyrol in the affected tissues. Result good.

XX.—MISCELLANEOUS.

Usher, C. H.—Notes of a case of unilateral white eyelashes and tufts of hair. *Transactions Ophthalmological Society* U.K., 1906.

Usher's (Aberdeen) case is a girl of three years, who has white eyelashes, upper and lower, on the left side, and two tufts of white hair on the left side of the scalp. The condition was noted on the third day after birth, and there are no changes in the skin to account for it locally. The family tree is given to show the type of complexion of the family. There is nothing to suggest albinism except that in the second generation—the patient belongs to the fifth—there was one female fairer than the rest of the family. There is nothing in the eyes of the patient to suggest albinism, other than the white eyelashes. There is no consanguinity in the family history. ERNEST THOMSON.

Lawson, Arnold, and Coats, George.—Further history and pathological examination of a case of congenital anterior staphyloma, previously shown by Mr. Arnold Lawson. *Transactions Ophthalmological Society* U.K., 1906.

This is a minute description by **Coats** (London), of the pathological examination of a case of congenital anterior staphyloma

which had been described in the Society's *Transactions* for 1905, p. 314. The case is one of extreme rarity, and it is quite impossible in an abstract to do justice to the close description of the sections and the deductions therefrom. ERNEST THOMSON.

Lagleyze.—The eye in albinism. (El ojo de los albinos.) *Arch. de Oftal.*, Octubre, 1906.

In this long paper, which is not easily abstracted, **Lagleyze** deals with the whole subject of albinism as it affects the eye. He points out that the defect of vision is not due only to the blurring occasioned by the excess of entering light, but that the absence of the choroidal and retinal pigment allows the sclerotic to reflect light back on to the retina, which light being diffused, blurs the image even more than the light from the front. That this theory is correct, is shown by the fact that it does not improve the visual acuity to fix a pinhole in front of the eye. As to treatment, Lagleyze thinks that it should be possible to guard against the occurrence of albinism by preventing marriages of those affected, especially when the parents are related. This is a counsel of perfection, and generally it is necessary to treat the affected individual. It is useful to correct the error of refraction, which is almost always present, and to order the correction in smoked glasses to lessen the glare. But beyond this little can be done. HAROLD GRIMSDALE.

Best.—The vitreous body in movements of the eye—a contribution to the etiology of retinal detachment. (Der Glaskoerper bei Augenbewegungen, zugleich ein Beitrag zur Ætiologie der Netzhautabloesung., *Klin. Monatsbl. f. Augenheilk.*, 1904, Bd. II, p. 538.

In examining the movements of the "mouches volantes" of his own eye, **Best** comes to the conclusion that the vitreous body is moved with every movement of the eye, especially in its peripheric region. Best thinks that this dislocation of the vitreous body may contribute to the development of retinal detachment. A. BIRCH-HIRSCHFELD.

Vogt, A.—Protection of the eyes from the ultraviolet rays of strong light by means of a new, almost colourless glass. (Schutz des Auges gegen die Einwirkung ultravioletter Strahlen greller Lichtquellen durch eine neue, nahezu farblose Glasart.) *Arch. f. Augenheilk.*, Dezember, 1907, p. 48.

Vogt finds that a variety of heavy flint-glass manufactured by Schott and Genossen in Jena under the designation "type O, 198," is colourless in thin layers and yet absorbs the maximum quantity of ultraviolet rays which can be absorbed by a colourless glass. The glass promises to be useful for spectacles, as a protection against the injurious effects of intense light; nothing, however, is said about the wearing qualities, a matter of importance in flint glass. P. J. HAY.

Herbert, Major H., I.M.S.—Two cases of colloid (hyalin) degeneration of tarsus and conjunctiva. *Royal London Ophthalmic Hospital Reports*, Vol. XVI, Part 2.

Case 1 was a Hindoo woman, aged 39, whose right upper lid was alone affected; the lid was swollen and drooping from considerable thickening and vertical enlargement of the tarsus. The tarsus and conjunctiva had a yellow tint. A good deal of fine wax-like tissue was removed with but little bleeding. Case 2 was a male Hindoo, aged 25, whose right upper lid was swollen; the tarsus was considerably thickened, and made up mainly of two petrified masses covered with conjunctiva; when this was divided these shelled out. A few spicules and strips of true bone were afterwards found in sections of one of the masses, while none was present in the other. From the swollen retro-tarsal conjunctiva, when incised, much soft wax-like material could readily be expressed. The histological characters are carefully discussed, and the paper is illustrated by three photomicrographs. C. DEVEREUX MARSHALL.

Mayou, M. S.—On metastatic infection of the eye associated with (*a*) cerebro-spinal meningitis, (*b*) typhoid fever. *Royal London Ophthalmic Hospital Reports*, Vol. 16, Part 4.

Mayou (London) records two interesting cases which show, beyond any possibility of doubt, how the eyes became infected from some distant part of the body which had infective organisms present. Case 1 was a boy, aged three years, who was taken ill on November 1st, 1905, and who died on November 3rd. When first seen, the eyes were healthy and the fundi were well seen. On the day he died he had developed a large hypopyon. The autopsy showed cerebro-spinal meningitis, in which the diplococcus meningitidis was present. The pus in the anterior chamber contained multitudes of the same organism, and the vitreous was just becoming affected. The original place of infection was the ciliary body. Had the child lived, doubtless the condition known as "pseudo-glioma" would have been present. The second case was that of a man who was suffering from typhoid fever; he had previously been affected with iritis. Thirteen days before the eye was excised, paracentesis was done to relieve tension, but no infection took place. On examining the eye after excision, the anterior chamber was filled with tough exudation, but contained very few pus cells. The vitreous was filled with reddish-brown pus. Smear preparations showed that the organisms present were the bacillus typhosus, but, owing to the eye having been hardened in formol, no cultivation could be obtained. This patient also had other metastatic typhoid deposits, *e.g.*, pleurisy, so that there is practically no doubt as to the nature of the eye lesion, both in this case and in the previous one. C. DEVEREUX MARSHALL.

Palermo, C. — Toxic retrobulbar neuritis. (**Nevrite retrobulbari tossiche.**) *Annali di Ottalmologia*, Anno XXXVI, p. 421, and *La Clinica Oculistica*, Gennaio, 1906.

Palermo experimented on dogs and rabbits by means of santonin, which he found does not cause appreciable histological changes in the optic nerve, chiasma, and optic tracts; by means of aniline oil and iodoform, which brings on proliferation of the nuclei of the connective elements without alteration of the nervous fibres; and, finally, by means of male fern poison, which causes marked destruction of the nervous fibres accompanied by nuclear proliferation and followed by complete atrophy of the optic nerve. Besides the above experiments, the author gives the clinical history of a boy, who, after the administration of strong doses of male fern, suffered from optic atrophy due to inflammation of the parenchyma. He also studied the effects of alcohol and tobacco among the *employées* at the Royal Tobacco Factories in Catania. In the latter amblyopia, in addition to the usual treatment, the author uses a daily administration of 5 minims of a 1 per cent. solution of pilocarpin hydrochlorate with great benefit. CHARLES MANCHÉ.

Bertozzi.—The colour and light sense in some diseases of the nervous system. (**Il senso cromatico e luminoso in alcune malattie del sistensa nervoso.**) *Annali di Ottalmologia* and *La Clinica Oculistica*, Gennaio, 1906.

By aid of Chibret's photometer, Holmgren's skeins, and Guaita's revolving discs, the author determined the colour sense, and by means of Landolt's perimeter, the field of vision for white and coloured lights, and came to the following conclusions:—

Epilepsy.— F. V. for white contracted in the majority of cases, for colours contracted, especially for blue, the limits of which are encroached upon by those for red—central colour-sense altered for violet, normal for red and green—L. D. high.

Acute Dementia.—F.V. for white contracted regularly, for for colours constantly contracted, especially for red—central colour-sense very deficient for red, less so for violet, and normal for green. Light-sense generally intact.

General Paralysis of the Insane.—F. V. for white constantly and regularly contracted, for colours contracted regularly in a marked degree for all colours. Central colour-sense and light-sense generally normal.

Neurasthenia.—F. V. for white always contracted, for colours sometimes contracted irregularly, the encroachment of the fields for colours being constant especially for red and green. Central colour-sense deficient for red and violet, normal for green; light-sense in the majority of cases normal.

Hysteria.—F. V. for white is sometimes normal, at other times

contracted, but circular in shape, for colours the contraction varies with different colours, the limits for green being sometimes larger than the normal. Central colour-sense diminished for all colours or for one colour only. Light-sense normal.

CHARLES MANCHÉ.

NOTE.—According to Parinaud (Norris and Oliver's *System of Diseases of the Eye*, Vol. IV), it is the field for *red* which is the last affected in hysterical dyschromatopsia. "As a result of this peculiarity, the space occupied by the latter may exceed in size the field for blue. We have with this inversion of the color-field much more certain evidence of dyschromatopsia than in its limitation alone."

C. M.

Gross, O.—Scleral rupture with prolapse of the retina. (Ueber Scleralruptur mit Vorfall der Netzhaut.) *Arch. f. Augenh.*, Februar, 1907.

Gross describes the macroscopic and microscopic appearances of the condition. PERCIVAL J. HAY.

Antonelli.—The indications of conservative and radical operation in severe injuries of the eye. (Indicazioni di terapia conservatrice o di operazione radicali, ne traumatismi gravi del globo oculare. *Rivista Italiana di Ottalmologia*, March-May, 1907.

Antonelli (Paris) comes to the following conclusions: enucleation is necessary in the presence of retained foreign bodies, although the eye may be saved, even after the entrance of a foreign body, if it be possible to extract it; it is necessary also after any very extensive contused and lacerated wound with loss of vitreous, after very large and deep burns, and after any large wound, in which there is permanent entangling of the uveal tract or depression of the scar. On the other hand, it is right to adopt conservative treatment, at least for a time, after small wounds, limited burns, and even in extensive wounds of the cornea or sclerotic, if there be no prolapse of the uvea. S. S.

Koster, W. — A fixation forceps. (Eine Fixations-Pincette.) *Zeitschrift f. Augenheilkunde*, Dezember, 1907.

Koster describes a new design of fixation forceps and illustrates it by a woodcut. The toothed blades are bent forwards at an angle of 45 degrees, so that the hand of the assistant is kept out of the way of the operator.

T. HARRISON BUTLER.

Birch-Hirschfeld, A.—A further contribution to the action of Roentgen rays on the human eye. (Weiterer Beitrag zur Wirkung der Roentgenstrahlen auf das menschliche Auge.) von Graefe's *Archiv f. Ophthalmologie*, Bd. 66, i, 8 Juni, 1907.

In contradiction to the frequent reports on the perfect harmlessness of Roentgen or radium rays if applied to the eye

or its neighbourhood, it is most important to point to the very real danger which all these manipulations entail, and to the absolute duty of the surgeon to guard the eye in all possible ways against these evil consequences. **Birch-Hirschfield** had an opportunity to examine an eyeball which had been treated by X-rays for a carcinoma in the neighbourhood of the external canthus. He found, besides a few old scars in the anterior layers of the cornea, vacuolisation and chromolysis of the ganglionic cells and degeneration of the vessels of the retina, and, to a minor extent, also of the iris and the ciliary body.

R. GRUBER.

Fisher, J. Herbert.—A case of microphthalmia. *Trans. Ophthal. Society* U.K., Vol. XXVIII, Fasc. 2, 1908.

Fisher (London) exhibited a baby whose right orbit was occupied by an "attempt at an eye," not bigger than a small pea, associated with a fluid cyst in the lower eyelid. The other eye showed a coloboma of iris and choroid. The infant presented no additional deformities.

Fisher, J. Herbert.—Fundus changes the result of injury at birth. *Trans. Ophthal. Society* U.K., Vol. XXVIII, Fasc. 2, 1908.

Fisher's case (London) was in a child who showed a mass of glistening connective tissue springing forward into the vitreous from the side of one optic disc. The affected eye was smaller than its normal fellow. The condition was believed to follow injury at birth (laceration of optic nerve and vessels, together with hæmorrhage into the canal of Cloquet). V. = no p. l.

Parsons, J. Herbert. — (?) Metastatic neuro-retinitis. *Trans. Ophthal. Society* U.K., Vol. XXVIII, Fasc. 2, 1908.

REVIEWS.

Transactions of the Ophthalmological Society of the United Kingdom. Vol. XXVIII, Fasc. 2, 1908. London: J. & A. Churchill, 7, Great Marlborough Street. Price, 4s. net.

This slender but well-illustrated and well-edited booklet represents the second fasciculus of the twenty-eighth volume of the Transactions of the Ophthalmological Society of the United Kingdom, and contains the proceedings of the Society from December, 1907, to March, 1908. Its contents will be noticed in due course in the columns of THE OPHTHALMOSCOPE. In this place we may merely regret that its inartistic paper back of

crude greens and reds has been retained, and that neither an adequate table of contents nor an index of any kind has been supplied. An economy of this sort reflects small credit upon those responsible for the publication. It detracts, besides, seriously from the value of the fasciculus.

A Manual of the Diseases of the Eye. By CHARLES H. MAY and CLAUD WORTH. Second edition. Pp. 400. Demy 8vo.; 336 illustrations, including 22 coloured plates. London: Baillière, Tindall, & Cox, 8, Henrietta Street, W.C. 1908. Price, 10s. 6d. net.

A second edition of May and Worth's *Manual of the Diseases of the Eye* has been called for within the comparatively short space of two years, thereby affording conclusive evidence of its utility and popularity. The present edition has been carefully revised, although no considerable alterations have been made in other directions. The *Manual*, as it stands, is a most attractive book, and one well-fitted for students and practitioners of medicine. To the specialist it will appeal with less force, since as we have pointed out before (*see* THE OPHTHALMOSCOPE, 1906, p. 428) "it is, in fact, essentially an elementary text-book, leaving references altogether on one side, paying scant attention to rare affections, but dealing at considerable length with the commoner diseases and operations." We know no book of the size that is so liberally provided with black-and-white and coloured illustrations. It is a pleasant *vade mecum*, and the knowledge it contains is conveyed to readers in good, plain English. We confidently recommend May and Worth's *Manual* to those who are beginning the study of ophthalmology. They could have no better guide.

The Principles of Refraction in the Human Eye Based on the Laws of Conjugate Foci, by SWAN M. BURNETT, M.D., Ph.D., Professor of Ophthalmology and Otology in the Georgetown University Medical Schools, etc., Washington, D.C. Illustrated with 25 original diagrams by CHARLES F. PRENTICE, M.E. The Keystone Publishing Co., Philadelphia, U.S.A.

This, the latest and most complete edition of Burnett's well-known elementary treatise on the refractive function of the eye, can be recommended for perusal and study both by the undergraduate in medicine and the beginner in ophthalmology.

C.A.O.

Atlas und Grundriss der Ophthalmoscopie und Ophthalmoscopischen Diagnostik. Von Prof. Dr. O. HAAB in Zürich. **Atlas and Epitome of Ophthalmoscopy and Ophthalmoscopic Diagnosis.** By Prof. Dr. O. HAAB, of Zürich. With 151 coloured figures. Fifth German edition. Munich: J. F. Lehmann, 1908. Price, 12 marks.

Haab's *Atlas of Ophthalmoscopy* has long since established

itself as an indispensable part of the equipment of every student of ophthalmoscopy. Its handy size, the completeness of the contents, the fine quality of the drawings, and their general faithfulness to nature, and, above all, the inclusion of none but really useful pictures, are features which commend it to every practical worker.

The introduction into the later editions of drawings to illustrate the microscopic appearances corresponding to certain fundus conditions, added much to the usefulness of the book, and the illustrations have been improved and added to from time to time.

The present edition is not a mere reprint of its predecessor. Two pictures of fundus changes resulting from birth injury have been added, one of pigmentary degeneration of the retina has been replaced by a better one, and the text has also received some additions and alterations without adding appreciably to the size of the book. It might have been wise to follow the example of the English edition in giving a plate to illustrate arteriosclerosis in the retina.

One has no hesitation in saying that the *Atlas* well deserves the popularity which it has achieved.

ARTHUR J. BALLANTYNE.

Ueber den Frühjahrskatarrh. Von FRIEDRICH FELDMANN, Giessen. **On Spring Catarrh.** By Friedrich Feldmann. Halle a. S. : Carl Marhold, 1908. Pp. 30. Price 9d.

This is one of the pamphlets on ophthalmic subjects of interest that appear at irregular intervals under the auspices of Professor Dr. A. Vossius The writer, Dr. Feldmann, follows in his account of the disease the description originally given by Dr. Saemisch and Professor Axenfeld. The cases of the disease he notes appear to be most common in young males, and to be very unequally distributed amongst the population, varying considerably in different years. The writer of this notice can recall only one unmistakable case in many years' experience occurring in a boy of 15, relapsing for several years in succession, and terminating in perfect recovery. The chief interest of the pamphlet has reference to the ætiology of the disease. Some observers have thought it occupies an intermediate position between affections of the general system—as, for example, multiple swellings of the glandular system—and conjunctivitis, whilst others consider it to be associated with various dermatoses, as psoriasis, lichen, erythema, and eczema. Considering, however, how imperfect is our knowledge of these dermatoses, it cannot be said that such views constitute any great advance in our conception of the disease. Although, as might have been expected, various micro-organisms have been observed in association with the malady, none has been found so constantly present as to render it certain that it is the true

ætiological factor. Recently, it has been suggested by Dr. Dimmer that such a factor may be found in the violet rays of the solar spectrum, on the ground that Professor Kriebrich, in some cases of hydroa vacciniforme—a disease induced by the action of light upon the skin—has noted an affection of the eye, similar to that observed in spring catarrh. Kriebrich was naturally led to surmise that removal of the supposed cause should effect the cure of the disease. He accordingly applied a bandage, excluding light from one eye, and was agreeably surprised to find that, at the expiration of a week, the bandaged eye had improved, and in three weeks was practically normal. On now re-admitting light to the previously occluded eye and bandaging the opposite one, recovery took place in the one, whilst a relapse occurred in the other. This observation agreed well with the other characters of the disease, with its attack on the uncovered portion of the bulb between the lids, with the affecting of both eyes, with its affecting the two eyes simultaneously, with its recurrence with the return of vivid light in spring, and with the failure of all therapeutic measures hitherto tried. While Kriebrich's observations were confined to cases complicated with the presence of a skin disease—hydroa vacciniforme, Dimmer proposed this mode of treatment in four cases of spring catarrh—that is, in cases not associated with any skin affection, and with success, yet since all cases of spring catarrh are not amenable to the simple preservation of the eye from the action of light, it is probable that some other factor or factors may exist.

Dr. Feldmann has collected 81 cases from the Giessen note books, which show diversity of age, varying in age from 3 to 33 years, whilst 63 occurred in males, and 18 in females. The age of from 6 to 15 years was by far the most common.

HENRY POWER.

NOTES AND ECHOES.

Obituary.

DR. C. H. PEETE, an eye and ear surgeon of Macon, Ga., died on April 13th last at the early age of 45 years. Dr. Gustavus Hay, a well-known oculist practising at Boston, died at Jamaica Plains on April 28th last, aged 78 years.

* * * *

Appointments.

H. CYRIL WALKER has been appointed additional lecturer on ophthalmology in the Faculty of Medicine of University College, Bristol. Francis R. Hill has been appointed surgeon-in-charge of the new Eye Department of the Cumberland Infirmary, Carlisle.

Dr. E. B. Demaria has been nominated professor of ophthalmology in Buenos Ayres. Dr. Otto Wernicke has been appointed director of the Buenos-Ayres Eye Hospital, in succession to Dr. Guerria, deceased. Dr. Finlay (junior) has been appointed professor of ophthalmology in the University of Havanna. Dr. J. I. Hogue has been appointed assistant editor of our admirable contemporary, *Ophthalmology*. The Colorado Ophthalmological Society has appointed the following executive officers :—Chairman, Dr. D. B. Strickler ; Treasurer, Dr. Melville Black ; Secretary, Dr. Geo. F. Libby. Drs. R. McKay and J. A. Ellegood have been elected Eye, Ear, Nose, and Throat Surgeons to the Delaware Hospital, Wilmington, Delaware, U.S.A.

* * * *

Ophthalmic Section A.M.A.

An informal luncheon was given to the resident and visiting members of the Ophthalmic Section of American Medical Association by Drs. Casey Wood, Frank Allport, and Thomas Woodruff, on June 2nd, at the time of the meeting of the Association at Chicago.

* * * *

Benefactions.

The sum of one thousand pounds sterling has been bequeathed to the West of England Eye Infirmary at Exeter, by the late Mr. R. H. Wood, of Sidmouth. By the will of the late Jane B. Shain, one thousand dollars has accrued to the Working Home for Blind Men and Women at Philadelphia, Pa.

* * * *

Dinner to Mr. E. T. Collins.

A dinner was given to Mr. E. Treacher Collins, of London, on June 3rd last, under the auspices of the Chicago Ophthalmological Society. It was held at the Calumet Club, an exclusive association, of which Dr. T. A. Woodruff has recently been elected President.

* * * *

Astigmatism.

Describing the life of that eminent Scot, Sir Donald N. Wallace, the *World* makes a singular statement about the state of ophthalmic knowledge in this country some forty years ago. Whilst a student in Edinburgh in the early sixties Sir Donald found that he was unable to read for more than a few minutes at a time. He accordingly consulted "the best men" in

England, but it was not until he saw v. Graefe in Berlin that the cause of his distress in the shape of astigmatism was diagnosed and remedied.

* * * *

The National Eye Hospital, London.

It may be news to many of our readers that some eight months ago saw the birth of an institution, called the "National Eye Hospital," intended for patients too well off legitimately to seek hospital advice and yet too poor to pay the specialist's ordinary fee. It is (or hopes to be) a self-supporting institution, which does not advertize, makes no appeal to the charitable public, and where every patient has to pay the sum of half a guinea for medical advice. The premises are situate at the corner of Oxford Street and Wardour Street, London, W., and consist of one large room on the first floor, divided by partitions into a waiting room (well furnished with comfortable chairs and current periodicals), a consulting room, with a couple of screened-off dark rooms, and a small operating room. The rest of the "Hospital" is made up of a tiny lobby, a lavatory, and a secretary's room. In other words, the place, although modest, is more or less adequate to deal with out-patients. An in-patient department, included in the original scheme, has been abandoned on account of the incidental and inevitable expenses. But there is now a working arrangement with a nursing home, whereby clients of the "Hospital" are received for the sum of two or three guineas a week. The institution is staffed by three medical men, all of whom have some experience of eye work, and who are at present unsalaried. Opticians, to whom the "Hospital" largely owes its inception, have no place on the staff, and no spectacles are supplied by the "Hospital" direct to patients. It is governed by a committee of eight members, including the three members of the medical staff. It is open from 2 until 4 p.m. daily, and on Tuesday and Friday evenings from 6.30 to 8.30 o'clock. The expenses are guaranteed for five years by the efforts of the founders, one of whom, a lady hailing from the north of England, has contributed a large sum towards maintenance. It is only to be expected that opticians will send their clients to the new place, seeing that under the present system of exclusive dealing, they are not very likely to see their customers again when the latter have been referred to any of the metropolitan eye hospitals. A departure of the kind indicated above is, of course, opposed to all medical tradition, and obviously opens the door to grave abuses. At the same time, the scheme, if honestly worked by those responsible for it, is capable of reaching a class for which no adequate provision is made under the present arrangements. It is entirely a question

of management and of straight dealing. It will be time enough to condemn or to praise the departure when more is known of its working. In the meantime it seems but fair to suspend judgment.

* * * *

The "big stick" policy.

SOME time ago, as readers will doubtless recollect, the Ophthalmological Society of the United Kingdom declined by an overwhelming majority of suffrages, to join the proposed amalgamation of medical societies, now known as the Royal Society of Medicine. Wisely, as it seems to us, the latter body did not then attempt to create a section of ophthalmology. Now, however, it is rumoured that such a step is meditated, and we hear that *pourparlers* to that effect have taken place. We do not profess to be in the counsels of either body, but it would be a thousand pities to divide our speciality into two camps, as would inevitably be the case if the Ophthalmological Society is to continue its separate existence and the Royal Society of Medicine is to start an ophthalmological section.

* * * *

The Temple Flower Show.

THE Veitchian Cup, the blue ribbon of the famous Temple Flower Show, held every year in the beautiful grounds of the Inner Temple, London, has been won this year by an ophthalmic surgeon, Mr. F. Menteith Ogilvie, of Oxford. The Cup has seldom fallen before to an amateur.

* * * *

A Diploma in Ophthalmology.

IT may not be generally known that at a meeting held on March 14th, 1908, the Board of the Faculty of Medicine of the University of Oxford resolved that it was desirable to establish a Diploma in Ophthalmology, to be granted after a period of special study and the passing of a rigid examination. The general conditions regulating the licence would be similar to those of the Diploma of Public Health (D.P.H.), which the University has granted for several years. It would mark a forward step on the part of the oldest English University, since at the present moment there is nothing of the sort in the United Kingdom, although there probably soon will be. Its possession would stamp a man as having gone through a course of special study and passed a special examination in the line which he intended to pursue in medicine. Under these circumstances one can but deplore the fact that a difference of opinion exists as to the advisability of

instituting a Diploma in Ophthalmology. The Regius Professor of Medicine in the University, Dr. William Osler, has accordingly thought it well to ascertain the views of the members of the Oxford Medical School on the subject, and for that purpose has issued a memorandum inviting an expression of opinion from those immediately concerned. It is to be feared that the result of the *plébiscite* will be adverse to the scheme, inasmuch as most of those who have been approached can scarcely be supposed to be acquainted with the *pros* and *cons* of the problem, and, besides, conservatism is a prominent feature in the English race. Dr. Osler's circular bears the date June 16th, 1908, and answers are requested before June 30th.

* * * *

Wills' Hospital, Philadelphia.

THE following changes for the years 1908 and 1909 have taken place at Wills' Eye Hospital, Philadelphia, U.S.A. Drs. Samuel D. Risley and Charles A. Oliver have respectively been elected president and secretary of the Board of Attending Surgeons to the Hospital; Dr. S. Lewis Ziegler has been appointed executive medical officer; Dr. Harold G. Goldberg has been appointed pathologist and curator; Dr. J. Milton Griscom has been appointed as Dr. Ziegler's assistant surgeon; and, lastly, Dr. Charles W. Jennings has been elected resident surgeon to the institution.

* * * *

Quack remedies for the Eyes.

OUR contemporary the *British Medical Journal* has recently published an account, with a most damaging analysis, of certain nostrums popularly employed for the cure of distempered eyes. The list includes Singleton's eye ointment, Bostock's eye ointment, Leggett's new and marvellous remedy for the eyes, and Pomies' anti-cataract mixture. Singleton's ointment, of which about 55 grains costs 2s., contains 7·4 per cent. of red mercuric oxide, about 4 per cent. of beeswax, and a neutral substance which agreed in properties and analytical figures with a mixture of lard, Japan wax, and purified cocoanut oil. Estimated cost of ingredients, for 55 grains, one-ninth of a penny. Bostock's eye ointment, sold at 1s. 1½d. per pot containing half an ounce, contained small quantities of ammoniated mercury and an insoluble compound of lead which appeared to be the oxide. The ointment also included glycerine, a non-alkaloidal extractive, spermaceti, soft paraffin, and lard. Estimated cost for half an ounce under one halfpenny. Leggett's remedy takes the form of a coarse pink powder, which contains basic aluminium sulphate, anhydrous sodium sulphate, and colouring matter. The proprietor charges 2s. 9d., for a packet of 135 grains, the

estimated cost of which is one-twentieth of a penny. Pomies' anti-cataract mixture consists of potassium iodide, 5·6 per cent., glycerine, 56·5 per cent., starch, 6·4 per cent,, and water, 31·5 per cent., 162 grains, for which 2s. 6d. is charged, is estimated by the *British Medical Journal* to cost one-third of a penny.

* * * *

Dr. Duboys de Lavigerie.

In order to commemorate the devoted services of Dr. Duboys de Lavigerie, who for many years has acted as secretary, the French Ophthalmological Society has determined to present a souvenir to the gentleman in question. Subscriptions are limited to ten francs, and the list will close on July 15th next. Dr. Péchin, 168, Boulevard Saint-Germain, Paris, will be glad to receive subscriptions to the fund.

* * * *

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The Fifth Annual Course on Ophthalmology has been arranged from July 6th to 18th. The main idea of the Course is to demonstrate (on actual patients as far as possible) the whole range of Ophthalmology, in order to make the reading of a text book more profitable than can be the case when relying merely on pictures.

The first part will be mainly devoted to demonstrating the practical examination of eye patients, the use of the Ophthalmoscope, and the work of refraction. During the second part the work will be more specialised.

As well as the mere routine cases, there will be a large selection of patients of unusual interest for the benefit of those who are more experienced in eye work. Altogether some 500 cases will be present for demonstration.

SYLLABUS.

PART I.

MONDAY, JULY 6th.

10—11	Clinical lecture on the External Examination of the Eye, and Visual Acuity; by the Reader.
11.30—1	Practical demonstration of the above; by the Hospital Staff.
2—3	Clinical lecture at the Radcliffe Infirmary; by Professor Osler.
3—5	Practical instruction at the Eye Hospital; by the Hospital Staff.
8.30	Clinical lecture on the methods of using the Ophthalmoscope; by Mr. P. Adams

TUESDAY, JULY 7th.

10—11	Lecture on Refraction; by Mr. P. Adams
11—1	Practical demonstration of the methods of estimating Refraction; by the Hospital Staff.
2—3	Clinical lecture at the Radcliffe Infirmary; by Professor Osler.
3—5	Practical instruction at the Eye Hospital; by the Hospital Staff.
8.30	Practical instruction on the Ophthalmoscope; by the Reader.

WEDNESDAY, JULY 8th.

10—11	Clinical lecture on the Field of Vision; by Mr. P. Adams.
11—12	Practical demonstration of the Field of Vision; by the Hospital Staff.
12—1	Practical instruction at the Hospital; by the Hospital Staff.
2—5.30	Practical instruction at the Hospital; by the Hospital Staff.
8.30	Lecture on functional troubles; by the Reader.

THURSDAY, JULY 9th.

10—1	Practical instruction at the Hospital; by the Hospital Staff.
2—5	Practical instruction at the Hospital; by the Hospital Staff.
8.30	Demonstration of Microscopic Appearances; by Dr. Moorson-Wood.

PART II.

FRIDAY, JULY 10th.

10—11.15	Lecture on the Conjunctiva; by Mr. Ormond.
11.30—12.45	Lecture on the Cornea; by Mr. Ormond.
2—3	Clinical lecture at the Radcliffe Infirmary; by Professor Osler.
3—5	Practical instruction at the Hospital; by the Hospital Staff.
8.30	Lecture on Congenital Anomalies; by Mr. Sydney Stephenson.

SATURDAY, JULY 11th.

10—11.15	Ocular Therapeutics; by Mr. Sydney Stephenson.
11.30—1	Lecture on the Lens; by the Reader.
2—5	Practical instruction at the Hospital; by the Hospital Staff.

MONDAY, JULY 13th.

10—11.15	Lecture on the Choroid; by Mr. Holmes Spicer.
11.30—12.45	Lecture on the Retina and Optic Nerve; by Mr. Holmes Spicer.
2—5	Practical instruction at the Hospital; by the Hospital Staff.
8.30	Lecture on the Iris and Ciliary Body; by Mr. Arnold Lawson.

TUESDAY, JULY 14th.

10—11.15	Lecture on Glaucoma; by Mr. Arnold Lawson.
11.30—12.45	Medical aspect of Ophthalmology; by Dr. James Taylor.
2—5	Practical instruction Thereon; by Dr. James Taylor.
8.30	Lecture on the Orbit and Lacrymal apparatus; by Mr. P. Adams.

WEDNESDAY, JULY 15th.

10—11	Clinical lecture at the Radcliffe Infirmary; by Professor Osler.
12—1	Practical instruction at the Hospital; by the Hospital Staff.
2—5	Practical instruction at the Hospital; by the Hospital Staff.

THURSDAY, JULY 16th, and FRIDAY, JULY 17th.
Addresses, Special demonstrations and the examination of interesting and unusual cases.

The Course will be illustrated by the lantern. Fee for the Course, £5 5s. Gentlemen attending the Course will be provided with Board and Residence at Keble College at the rate of 7s. 6d. a day during the second week but during the first week lodgings must be secured.

For further particulars apply to ROBERT W. DOYNE, M.A., Margaret Ogilvie's Reader in Ophthalmology in the University of Oxford, 30, Cavendish Square, London, W.

THE

OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

VOL. VI.—No. 8.] *AUGUST 1, 1908.* [TWO SHILLINGS.

CONTENTS.

Original Communications—

1. Stephen Mayou, F.R.C.S.—Some Staphylococcal Infections of the Eyes and their Treatment with Vaccine... 566
2. E. Treacher Collins, F.R.C.S.—Developmental Deformities of the Crystalline Lens 577
3. Sydney Stephenson, C.M.—On a little known Type of Amblyopia in Children 584

Clinical Memorandum—

1. T. Harrison Butler, M.D.—An Albino Family 589

Novelties—

1. Portable Illuminative Attachment for the Ophthalmoscope... ... 590
2. An Improved Tinted Glass, "Chlorophylle," for Eye Protectors and Spectacles 592

Translation—

1. Dr. v. Pflugk.—The Treatment of Incipient Cataract with Potassium Iodide 593

Review—

Sydney Stephenson, C.M.—Some of the Newer Remedies in Eye Work 598

Current Literature—

I. Infections 617
II. Optic Neuritis in Cerebral Tumours... 620
III. A curious Vascular Anomaly of the Optic Disc 623
IV. Epilepsy and Eye-Strain 624
V. Pulsation in a Vena Vorticosa 624
VI. Papillitis after Injury or Disease of the Anterior Part of the Eye 625
VII. Syphilis and Myopia 626
VIII. The Ophthalmo-Reaction 628
IX. Conjugate Deviations of the Eyes and Cerebral Lesions ... 629
X. Nystagmus 631
XI. Spring Catarrh 632
XII. Arterio-sclerosis... 634
XIII. Embolism of the Central Artery of the Retina in Children ... 636
XIV. Parinaud's Conjunctivitis 637
XV. Muscle-Spindles in the Ocular Muscles 641
XVI. Remedies 641

Reviews 648

Correspondence 651

Notes and Echoes 652

ORIGINAL COMMUNICATIONS.

SOME STAPHYLOCOCCAL INFECTIONS OF THE EYES AND THEIR TREATMENT WITH VACCINE.

BY

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Most of the following cases were treated at the Central London Ophthalmic Hospital commencing in 1906 up to the present date. Although not comprising all the cases of staphylococcal infection which have been dealt with at that institution, they are not selected to show good or bad results of the method. I am indebted to my colleagues for allowing me to use the notes of their cases.

The vaccine used in the treatment of the cases given below was the mixed staphylococcal vaccine prepared by the Jenner Institution of Preventive Medicine. In cases which failed to yield to this treatment, a vaccine was prepared from the patient's local lesion, when a pure culture was obtainable. The method of preparation and administration was that used by Sir A. E. Wright. Although the opsonic index was watched in most of the cases, I think the vaccine can be safely administered without control, provided the initial doses are small. The danger of an overdose is an exaggeration of the local condition with a prolonged negative phase as occurred in the early stage of Case 1 and after the second injection Case 5. The first dose usually given was 500 million staphylococci which was increased up to 2000 million. In two cases there was noted a rise of temperature for about four hours after the injection, in one case to 103°F which was accompanied by a rigor and the other to 101.6°F.; beyond this and a little local pain at the site of injection no bad results were noticed.

One of the most striking points about the cases of extra-ocular infection with staphylococcus is that the lesions are frequently multiple. Thus, in acne rosacea, which was the first disease to be investigated, it was frequently found associated with styes, chronic conjunctivitis, blepharitis, and corneal ulceration. Indeed, it was rare to find any staphylococcal lesion in which one or more lesions were not associated, with the exception of one case of severe serpiginous corneal ulceration following on a direct injury, all the other cases had multiple lesions. The finding of the staphylococcus by smear preparations in the discharge from two or more of the lesions was taken to indicate that the disease was due to that

organism. Cultures were taken in all cases on blood-serum and agar. The staphylococcus albus was the organism most frequently found, the staphylococcus aureus being only present in one case of suppurating meibomian cysts.

In investigating the fluid from the anterior chamber, the source of error from contamination from the conjunctival sac is more liable to occur; therefore, every care must be taken to exclude this source of error in making cultivations from the intra-ocular fluid. In Case XI, given below, the fluid was obtained by a sterile glass pipette as it escaped from the anterior chamber after puncture with a keratome, the conjunctival sac having been first thoroughly purified. Although objection may be taken that the fluid was contaminated from the conjunctival sac, I hardly think that this was so in this case, since the fluid was collected as it escaped from the anterior chamber over the surface of the keratome and then inoculated on to the media. The colonies were so numerous on all the tubes in twenty-four hours that it could hardly be supposed to have arisen by accidental contamination. Undoubtedly, a more satisfactory method of collecting the aqueous would be by a hollow needle thrust into the anterior chamber.

In the cases of metastatic infection, in which the eyes were enucleated, they were placed at once into a sterile bottle; subsequently they were passed through the flame and opened by means of a sterile knife within ten minutes of the operation, smear preparations and cultures being taken from the vitreous and aqueous.

The cases described below are divided into two groups: I.—Extra-ocular infection; II.—Intra-ocular infection.

I.—Extra-ocular.

The extra-ocular lesions which were treated were acne rosacea, styes, phlyctenulæ, Meibomian cysts, chronic conjunctivitis, and corneal ulceration. As has already been pointed out, many of these conditions were associated.

Case 1.—Acne styes, phlyctenulæ, corneal ulcer.

E. M. Female, aged 28 years.—Attended the Hospital under Mr. W. I. Hancock on December 13th, 1905, with acne of the face. The acne consisted of minute suppurating points and comedones and showed little of the rosacea type. She had suffered from the condition for the last five years, and the face showed well-marked scarring. She attended the Hospital on account of two styes in the right eye and one phlyctenule. A pure culture of staphylococcus was obtained from a pustule on the face, from the stye, and the conjunctival

sac. The opsonic index for staphylococcus was 1·5. A vaccine was prepared from her own lesion, and a dose of 500 million staphylococcus injected.

January 4th, 1906.—Patient has had several more phlyctenulæ, and there is now a small marginal corneal ulcer in the right eye, presumably due to a rather too large dose of vaccine, since the opsonic index had dropped to 1·15. *January 11th*, 1906.—The condition was much the same as on the previous date. The opsonic index was 1·3. *January 23rd*, 1906.—The opsonic index had risen to 1·6. The face was rapidly improving, and the eye was well, the corneal ulcer having healed and there being no injection of the conjunctiva. She had had no more styes. *January 24th*, 1906.—Inoculated with 250 million staphylococcus. The patient remained well from this time up to March 3rd, 1906, when she came back to the Hospital with one or two suppurating points on the face and a stye. The opsonic index had dropped to 0·90. Five hundred million staphylococcus were given. *March* 16th, 1906.—Condition had much improved, and a further inoculation of 1,000 million staphylococcus was given and repeated on April 18th, 1906. *May 2nd*, 1906.—She was again inoculated with a similar dose. She had no recurrence of any eye trouble, but one or two spots on the face had appeared in the interval between the last two injections. She attended regularly for the following nine months, and there was no further recurrence of the spots on the face or of the eye trouble. The whole condition of the skin of the face was very much improved.

Of the four cases treated, this was by far the most successful result, ending, as it did, in complete cure. In the three cases of acne rosacea to be next described, while the eye condition cleared up temporarily, there was a strong tendency to recurrence, and the condition of the face did not improve.

Case 2.—Acne rosacea, and corneal ulceration, styes, tarsal cyst and phlyctenulæ.

M. W., female, aged 46 years.—Had severe acne rosacea of the face for eight years. Has had bad eyes for four years. When the patient attended, she had severe acne rosacea of the face, but with only comparatively few suppurating points. There was a chronic conjunctivitis of both eyes, one stye and two tarsal cysts, with phlyctenular ulceration of both corneæ.

February 9th, 1906.—Opsonic index for staphylococcus 1.1. Inoculated with 750 million staphylococcus vaccine. *February 18th*, 1906.—Ulcer commencing to heal, and face better. *March 3rd*, 1906.—Opsonic index 1. Face improving. Stye disappeared. Tarsal cysts, which had been opened at the first attendance, had healed (500 million vaccine given). *March 8th*, 1906.—Corneal ulcer healed. Face better, 0·5 cc. vaccine given.

March 14th, 1906, and *March 16th*, 1906.—Similar inoculations were performed. *April 4th*, 1906.—The eye condition was practically well, and the patient was sent to Dr. Arthur Whitfield for treatment of the face. The patient disappeared from the Hospital for eight months, when she attended again with a relapse of the right corneal ulceration. The condition of the face had much improved. The opsonic index then was 0·57. The patient was under treatment for a short time, but disappeared from the Hospital without much improvement.

Case 3.—Acne rosacea, phlyctenulæ, conjunctivitis, and blepharitis.

J. M., male, aged 45 years, admitted under Mr. Purvis. Acne rosacea of the face twelve years. His eyes had been bad for the last three years with recurrent attacks of phlyctenulæ, conjunctivitis, and blepharitis. Pure cultures of staphylococcus were obtained both from the face and the eye. *January 28th*, 1906.—Opsonic index 0·90. Inoculated with staphylococcus vaccine (500 million). *February 8th*, 1906.—The condition of the eye and face had not improved. Similar doses given. *March 3rd*, 1906.—Opsonic index 0·78. No change in eye and face. Similar dose of vaccine. *April 4th*, 1906.—Opsonic index 1·0. No improvement in the face. Eye better. Patient attended the Hospital for several weeks after this time, but beyond slight improvement in the eye, no definite improvement took place in the face.

Case 4.—Acne rosacea, corneal ulceration, phlyctenulæ.

F. F., male, aged 29 years. Has had severe acne rosacea of the face three years. When the patient attended he had had right corneal ulceration of some standing, with multiple phlyctenulæ. Pure cultures of staphylococcus were obtained from the discharge from the eye and the suppurating points on the face. *November 28th*, 1906.—Opsonic index, 0·44. Staphylococcus vaccine given (500 million). *December 12th*, 1906.—Corneal ulcer had healed, and the discharge from the eye had ceased. There were no phlyctenulæ. The face was slightly better. Although the improvement in the eye was maintained, the face did not improve. *April 13th*, 1907.—Condition of the eye relapsed. Patient ceased attending for treatment.

Case 5.—Boils and styes.

K. de B. Medical practitioner, aged 33 years. Has had for the last three months multiple boils on the neck and back. Three severe attacks of styes on both eyelids, two and three at a time. The staphylococcus albus was found in pure culture from the discharge, both from the boils on the neck and from the eye.

November 13th, 1906.—Opsonic index for staphylococcus 0.69. Staphylococcus vaccine given (500 million). *November 25th*, 1906.—Opsonic index 1. Styes had completely disappeared and the boils improved. Inoculation 1,000 million. *December 3rd*, 1906.—Opsonic index 0·61. There had been a fresh boil on the neck. *December 6th*, 1906.—Inoculation, staphylococcus vaccine (1,000 million). *December 18th*, 1906.—Opsonic index, 0·93. Boils completely gone and no further styes had appeared. The patient was seen at intervals up to June, 1907, and he had no recurrence of either boils or styes.

Case 6.—Styes and phlyctenulæ.

J. B., male, aged 25 years. Seen 15th December, 1907. When patient attended, there were multiple styes on both eyelids with phlyctenulæ of the conjunctiva. The patient had previously had five attacks in eight weeks, in spite of treatment by a medical man. The staphylococcus was isolated both from the styes and the conjunctival discharge. The opsonic index for staphylococcus was 0·37. The patient was inoculated with staphylococcus vaccine (500 million). The condition of the eyes cleared up in ten days and there was no further recurrence of the trouble.

Case 7.—Multiple recurring tarsal cysts and corneal ulcer.

A. B., male, aged 17 years. Attended the Hospital with a marginal corneal ulcer of the left eye and two suppurating Meibomian cysts on the lid. Under Mr. P. Wells. Previous to this, the patient had had several Meibomian cysts. The cysts were opened, and pure cultures of staphylococcus aureus obtained.

November 3rd, 1906.—Opsonic index for staphylococcus 0·5. Staphylococcus vaccine was given (500 million). *November 24th*, 1906.—Corneal ulcer was completely healed, and there was no further recurrence of the Meibomian cysts.

Case 8.—Neuro-paralytic keratitis. Staphylococcal infection.

H. L., female, aged 45 years. Right fifth nerve paralysis for three years for which no cause could be found. Anæsthesia of the right conjunctiva and cornea.

August 15th, 1906. The right eye was damaged by a gas explosion three days previously. On admission, there was a large hypopyon-ulcer, involving the lower half of the cornea, with much infiltration. The hypopyon occupied the lower third of the anterior chamber. There was marked ciliary injection and iritis, no photophobia being present. Pure culture of staphylococcus was obtained from scraping of the ulcer.

August 18th, 1906. Opsonic index for staphylococcus was 0·5, vaccine was given (500 million). At this time the hypopyon was increasing. T.+1.

August 28th, 1906.—The eye rapidly improving. The hypopyon had disappeared. The opsonic index was 1·0. *September 4th*, 1906.—The patient was discharged from Hospital. Ulcer nearly healed. *November 12th*, 1906.—The ulcer had healed soundly, with comparatively slight nebula. Two posterior synechiæ left.

Remarks.—Although these cases are inadequate to draw dogmatic conclusions, the results of the treatment of extra-ocular staphylococcal infection seem to be, on the whole, a considerable advance on the methods usually prescribed; practically, every case showed a temporary improvement and in most cases, except those associated with severe acne rosacea which would not yield to treatment, this improvement appeared to be permanent.

II.—Intra-ocular Infection.

The staphylococcus albus is undoubtedly frequently found in the normal conjunctival sac and the skin of the lid margins, and is the organism which is most frequently identified as the cause of suppuration after operation, when that unfortunate complication occurs. It is possible (Case 11), that the less virulent forms of the organism may be the cause of some of the cases of iridocyclitis which occur idiopathically after operation, and which occasionally end in sympathetic inflammation occurring in the other eye. Undoubtedly, infection of the blood-stream with the staphylococcus can take place without much general disturbance in the patient's temperature or health. This is borne out by the cases of metastatic infection given below (Cases 9 and 10), and in other cases of metastatic panophthalmitis which have been described; even in these cases the local inflammation in the eye is not extremely violent, one of the chief characteristics of the condition being the absence of pain and of photophobia.

Cases of intra-ocular infection are divided into metastatic and exogenous infection.

Metastatic.—Although the recorded cases of metastatic infection of the eye followed by suppuration are numerous, those in which an examination of organisms has been made are comparatively few. That the staphylococcus is not infrequently the organism present has been previously shown by Holmes Spicer[1] and also in a case recorded by Axenfeld[2]. Cases 9 and 10 are of a similar nature. Case 9 of mixed staphylococcal and tuberculous infection, and Case 10 of staphylococcal origin alone.

[1] *Transactions of the Ophthalmological Society* U.K., Vol. XXVII, 1907, p. 230.
[2] *Die Bakteriologie in der Augenheilkunde*, Jena, 1907.

Otitis media, boils, and pyorrhea alveolaris, seem to be the lesions most frequently present before the onset.

Case 9.—Metastatic Panophthalmitis.

L. D., female, aged 3 years. Admitted January 8th, 1908, under Mr. T. B. Archer. Five months ago, the patient had a tuberculous abscess in connection with the sternum which was operated on and subsequently a septic sinus formed. Some time previous to this, she had several septic tuberculous ulcers on the leg and also a septic tuberculous mastoid. When admitted to the hospital all the sinuses were discharging pus freely, which pus contained numerous staphylococci.

H.S.N. L.S.N. Urine 1,015. No sugar; no albumen; temperature normal.

Two weeks previous to admission the left eye had become red and gradually got worse. There was no pain or photophobia. On the morning of admission the upper lid had begun to swell. The eye was proptosed; there was some œdema of the upper lid; cornea hazy; acute iritis with small hypopyon; the pupil was occluded with lymph. T+1. No perception of light.

January 8th, 1908.—Excision was performed, during which operation the eye burst. Smear preparations and cultures were taken from the pus at the time of the operation. The patient made a good recovery from the operation with the exception that the temperature rose on the following day to 101·6° F.

Pathological examination.—The staphylococcus albus was found in the smear preparations of the pus from the eye and in pure culture on the media.

Histological examination.—The choroid and retina, which were much thickened, were eviscerated and embedded in paraffin, and sections cut. The ciliary body and iris showed well-marked polynuclear and mononuclear infiltration, together with a number of mast cells. The choroid showed very considerable thickening, which varied in extent. The whole was infiltrated with polymorphonuclear and lymphocitic exudation. In some situations there were typical tuberculous nodules with giant cells and epithelioid cells such as are found in miliary tuberculosis, as many as five being counted in one section. There was practically no caseation. The retina was much folded, detached, and densely infiltrated with polynuclear lymphocytes. There were multiple hæmorrhages into the retina. There were no giant cells or tuberculous formations in the retina. Although a careful examination was made for tubercle bacilli, none was found.

Case 10.—Metastatic Panophthalmitis.

E. R., female, aged 54 years. Admitted January 28th, 1907, under Mr. P. Wells. Patient's right eye became inflamed five weeks previous to admission. There was no pain or

photophobia. Before this she had had influenza. On admission the anterior chamber was half-filled with pus, there being a considerable amount of lymph on the surface of the iris above it. Marked ciliary injection; no fundus reflex. On the upper surface beneath the lid was a small swelling, which subsequently proved to be a sinus leading into the globe behind the ciliary body. The eye was enucleated.

Pathological Examination.—The whole globe was shrunken. After division with a sterile knife, smear preparation and cultures of the pus from the anterior chamber showed staphylococcus in pure culture. The retina and choroid were detached, matted together and densely infiltrated with polymorphonuclear leucocytes. Although there was a sinus present in the globe, no other organism beyond the staphylococcus was found, and hence it is extremely probable that the metastatic infection was due to this organism and not to the influenza bacillus, which has been found in some of these cases.

Having shown that the staphylococcus is a not infrequent cause of a not very virulent form of suppurative panophthalmitis the following cases are some evidence that probable metastatic infection by the staphylococcus may occur without suppuration.

Case II.—Metastatic Irido-Cyclitis.

A. le P., female teacher, aged 35 years. Admitted February 11th, 1908. The right eye had been "bad" for two weeks. There was no pain or photophobia. There was no specific history. The only source of infection that could be found was some decayed teeth. There was a fair amount of ciliary injection. The cornea was hazy, the surface from slight roughness of the corneal epithelium, the deep layers of the cornea having the peculiar striped appearance which is present in wrinkling of Descemet's membrane with infiltration of the deeper layers of the substantia propria. The whole back of the cornea was covered thickly with well-marked keratitis punctata. The tension was full. The pupil dilated moderately well with atropine. One posterior synechia up and out was present, which subsequently gave way. There was much vitreous opacity. Vision=the counting of fingers. The patient was admitted to the Hospital and put under specific treatment.

February 23rd, 1908.—T. + 1. The condition was much as at the time of admission. After thoroughly washing out the conjunctival sac, paracentesis was performed, and the aqueous collected by means of a sterile pipette as it escaped over the surface of the keratome, and inoculated on to agar and blood-serum. In twenty-four hours both tubes were covered with colonies of pure staphylococcus albus. Staphylococcus vaccine

was prepared and administered. The antisyphilitic treatment was stopped. Staphylococcus vaccine (1000 million). *March 10th*, 1908.—The condition of the eye had much improved. Tension normal; no ciliary injection; keratitis punctata had largely disappeared, together with interstitial opacity. Vision of right eye was $\frac{6}{9}$, still fine keratitis punctata. *March 31st*, 1908. Keratitis punctata had practically disappeared, except for a few fine pigment dots. The vitreous opacities had cleared completely. In the upper and outer part of the iris an atrophic patch, from which the fibres had almost completely disappeared, was apparent. It is possible that this patch may be the actual site of infection. Vision was $\frac{6}{6}$. Vaccine given (200 million).

From this time up to the present date the improvement had been maintained, and the eye is now perfectly quiet. No keratitis punctata or any signs of inflammation beyond the atrophic patch in the iris and a somewhat dilated pupil are present.

The following two cases, although not verified by examination for organisms, were probably of staphylococcal origin.

Case 12.

Mrs. D. Seen June 25th, 1907. During the last year the patient had had four teeth extracted for "abscessed roots." Five weeks ago, the patient went to a dentist with an abscess at the root of another tooth, and had gas, and the tooth extracted. The patient was rather ill after the administration of gas, and went home, and to bed. On waking in the morning, she found that the sight of the left eye had failed. Five weeks after this the patient consulted me. Left pupil sluggish; a fine keratitis punctata covering the whole of the back of the left cornea; vision $= \frac{6}{18}$. On examination of the fundus, there was seen a large patch of choroiditis between the disc and the macula, and intense optic neuritis. The patient was placed on 30 grain doses of iodide of potassium three times a day.

July 3rd, 1907.—The keratitis punctata had increased, the optic neuritis was more marked, and the vision $\frac{6}{24}$. Opsonic index for staphylococcus, 0·77. Staphylococcus vaccine, 1,000 million given. (The anti-syphilitic treatment was stopped.)

July 18th, 1907.—Opsonic index, 0·85. Vision $= \frac{6}{9}$. Keratitis punctata had disappeared and the choroiditis and neuritis rapidly subsiding. Staphylococcus vaccine, 1,000 million given.

July 31st, 1907.—Opsonic index for staphylococcus, 1·5. Staphylococcus vaccine given, 2,000 million. The patient's local condition had much improved; the neuritis had subsided.

September 13th, 1907.—The vision was $\frac{6}{5}$. No keratitis punctata. The position of the old choroiditis was marked by a white atrophic area, with some pigmentation. The disc was normal in colour.

The patient was seen subsequently on May 14th, 1908. Vision was $\frac{6}{5}$. She had had no recurrence of any abscesses of the teeth.

The infection in this case was probably embolic from the abscess at the root of the tooth, which are very frequently of staphylococcal origin.

Case 13.—Metastatic Irido-Cyclitis.

Mrs. B. Seen June 11th, 1907. In the previous spring the patient was confined, and subsequently was troubled with bad boils on the back and neck for some considerable time. The sight of the left eye began to fail about this time. The patient had been treated for a year with iodide of potassium, and sea voyages, with atropine locally, but in spite of treatment the condition did not improve. When first seen, the vision was reduced to $\frac{6}{60}$ + 2·5. The whole of the back of the cornea was covered with well-marked precipitates. The pupil was sluggish, but dilated evenly under atropine. The vitreous was filled with dense opacities, so that the details of the fundus could not be seen.

June 12th, 1907.—Opsonic index for staphylococcus 0·75. *June 14th*, 1907. Inoculated 750 million mixed staphylococcus vaccine. *July 24th*, 1907. Opsonic index for staphylococcus 1·5. The patient's vision had increased to $\frac{6}{18}$ partly + 2·5. The keratitis punctata was less, and the condition of the vitreous had improved, so that some of the details of the fundus could be made out.

August 4th, 1907.—Vision $\frac{6}{12}$. Opsonic index, 1·5. Staphylococcus vaccine administered (1,500 million). *August 13th.*—Opsonic index, 1·5. Vision $\frac{6}{6}$, two letters. The vitreous had cleared considerably, but keratitis punctata was still present. Staphylococcus vaccine given (2,000 million). *August 29th.*—Vision $\frac{6}{6}$. Vitreous considerably clearer, so that all the details of the fundus could be examined, which were normal. The keratitis punctata had disappeared, with the exception of a few spots. No further inoculations were made. The patient was examined from time to time up to June, 1908. The improvement was maintained, although a few spots of keratitis punctata were still present. Vision in the eye $\frac{6}{6}$.

Although in this case there was very marked improvement after the administration of staphylococcus vaccine, the patient could not be said to have completely recovered, as there are at the present time one or two spots of keratitis punctata and vitreous opacities still present.

Suppurative and non-suppurative forms of irido-cyclitis following operation.

The suppurative forms of irido-cyclitis (panophthalmitis) following intra-ocular operations, due to the staphylococcus albus, are well known. During the last three years, I have

examined three cases of suppuration following operation (all needlings). The staphylococcus albus was present in pure culture in all of them.

The evidence of micro-organisms in the eye which have been subject to the non-suppurative forms of irido-cyclitis are very rare. Indeed, as far as I can discover, no cases due to the staphylococcus have been recorded. It is probable that this is due partly to the fact that they are not looked for, and partly to the difficulty of finding the staphylococcus in sections of the globe, since the granules of the pigment are very liable to be mistaken for it. The evidence in the following case is not absolute, as the organism was only found on cultivation from the eye and it could not be definitely demonstrated in section.

Case 14.—Irido-Cyclitis following operation.

D. F. (female), aged 4 years. Admitted March 25, 1907, under Mr. W. I. Hancock.

Left eye was cut with glass bottle in December, 1906. The iris was prolapsed and was accordingly excised. The eye settled down after the operation, but three weeks ago became inflamed. On admission, the iris was green in colour; the pupillary margin adherent to the anterior capsule of the lens. No anterior chamber was present. The tension was +2. Much ciliary injection, but no keratitis punctata. Behind the lens, which was clear, on the inner side, could be seen a white mass. The retina was in its normal position. The eye was enucleated on March 27, 1907, and opened immediately after operation with a sterile knife. Cultures from the vitreous and anterior chamber showed the staphylococcus, but no staphylococci were found in the smear preparations or sections. The lens was pulled over by a mass of exudation which was present in the ciliary region. There was some exudation and several hæmorrhages into the vitreous and retina. The section showed a large mass of fibrous tissue in the ciliary region pulling on the lens, which was apparently cataractous in that region. A considerable amount of irido-cyclitis, with polynuclear and mononuclear exudation, was present.

Remarks.

Although the part played by the staphylococcus albus in the production of suppurative intra-ocular inflammation is undoubted, there is yet considerable proof wanted that the organism is the cause, or one of the causes, of non-suppurative irido-cyclitis. Although the cases described above are strongly suggestive, they are not put forward in any way as proofs that this organism is the cause of the disease, but rather as a suggestion for further investigation. A case of plastic irido-cyclitis following operation treated by staphylococcus vaccine

has recently been recorded by E. E. Maddox (THE OPHTHALMOSCOPE, June, 1908). Somewhat similar cases have been treated at the Central London Ophthalmic Hospital with the vaccine with varying results. Before any definite conclusion, however, can be drawn it is essential that a record of a large number of cases so treated be taken into consideration, and if proved, artificial immunization prior to operation be seriously considered.

DEVELOPMENTAL DEFORMITIES OF THE CRYSTALLINE LENS.*

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In the observations brought forward in this paper I propose to show how several forms of congenital cataract are the outcome of arrests of development in the lens at different stages in its development.

I am, naturally, aware that to attribute a condition to an arrest of development offers only a partial explanation of its etiology, leaving the cause of the arrest still to be accounted for. I think, however, I shall be able to demonstrate that a recognition of the stage at which the arrest of development has taken place, though we do know the actual cause of the arrest, helps to a clearer insight as to the meaning of the appearances presented by congenital cataracts, and also affords valuable hints as to the most suitable operative measures to employ in their treatment.

For descriptive purposes, I propose to summarize the development of the lens into the three following stages and then to point out how certain arrests of development occur during each stage :

(i) The down growth of a fold of cuticular epiblast, which is separated in the form of a hollow vesicle from the rest of the surface epiblast by intruding mesoblast, and surrounded by a hyaline capsule.

(ii) The lengthening out of the cells composing the posterior layer of the vesicle until they fill its entire cavity. These are the first formed lens fibres and exist as the most central part of the fully developed lens.

(iii) The proliferation of the cells lining the anterior capsule and their transformation at the sides of the lens into lens fibres. A transformation which is effected by their lengthening out

*An address read before the Oxford Ophthalmological Congress, *July 17th*, 1908.

anteriorly and posteriorly, so as to encircle the fibres developed from the posterior layer, lines of sutures resulting where their ends come in contact. This laying on of fresh fibres laterally goes on throughout life, but its rapidity is lessened as life advances by the increasing intra-capsular tension tending to check the proliferative activity of the cells.

(1) The arrests of development which I have to describe during the first stages have mainly to do with the capsule of the lens.

The hyaline capsule of the lens was at one time regarded as a structure of mesoblastic origin, and the product of the fibro-vascular sheath, which encircles the lens in fœtal life. There is, however, considerable evidence to show that it is really epiblastic in origin and formed as a kind of secretion from the epithelial cells lining it.

This evidence may be considered as embryological, anatomical, chemical, experimental and pathological.

Kölliker and Kessler pointed out that the capsule is present before the fibro-vascular sheath makes its appearance. We find also that the anterior and lateral parts of the capsule continue to grow and thicken with age, long after the vascular sheath has disappeared.

The anterior and lateral parts, which are lined by epithelial cells throughout life, are markedly thicker than the posterior, which is only lined by cells for a short time during early fœtal life. The anterior capsule in the adult lens has been estimated as 0·016 m.m. in thickness and the posterior as 0·008 m.m.

Though classed as an elastic membrane, it is found not to resemble yellow elastic tissue of undoubted mesoblastic origin, either in its chemical composition or in its staining reactions. In these particulars it has close affinity to the basement membranes of glands, which it is very probable are also the product of epithelial cells.

*Schirmer has shown that after experimental wounds of the anterior capsule, the gap first becomes closed by some rows of cells resulting from proliferation of the capsular epithelium beneath a layer of fibrin. Later a new hyaline layer makes its appearance across the space left by the retraction of the two extremities of the wounded capsule. This new hyaline layer is evidently the product of the epithelial cells on its inner surface, and is formed quite independently of any cells of mesoblastic origin.

In connection with anterior polar cataracts, new formations of a layer of hyaline capsule are sometimes met with beneath the opacity. A study of sections from a series of lenses with this form of cataract, which vary in the length of time which has elapsed since its formation, clearly establishes the epithelial origin of these new hyaline layers.

* *Archiv f. Ophthal.*, Bd. XXXV, Ab. 1, S. 220.

Anterior polar cataract most frequently occurs as a sequela of ulceration of the cornea in infancy; it may, however, be congenital. I have examined anatomically a lens with this form of opacity from an eye with congenital aniridia, in which the cornea was perfectly clear and healthy and had never been inflamed or ulcerated. In this specimen the microsopical appearances of the affected area were precisely similar to those seen in anterior polar cataracts, resulting from corneal ulceration.

*I have published a description of the histological appearances of anterior polar cataract in six eyes, in which the time which had elapsed from the formation of the opacity to that at which the eye was excised ranged from six weeks to 21 years.

In two, in which the opacity was of only six weeks' and eight weeks' formation respectively, the changes found consisted in some disintegration of the lens fibres at the anterior pole and proliferation of the cells lining the anterior capsule in that situation. As to which is the primary of these two processes there has been much discussion.

The one theory holds that the primary factor is the proliferation of capsule cells excited into an excess of activity by the neighbouring inflammatory condition of the cornea. It affords, however, no explanation of the occurrence of congenital anterior polar cataract, which, as I have already pointed out, may be present in an eye where there was no history of any inflammation having occurred, and where, after the most careful microscopical examination, not the least trace of any past inflammatory trouble can be detected.

The other theory, in support of which I have myself published some observations,† assumes the disintegration of the lens fibres to be the first change. This disintegration apparently results from a localized disturbance in nutrition due to contact of the lens at its most prominent part, the anterior pole, with the inflamed and swollen cornea. In an infant's eye, with its exceedingly shallow anterior chamber and very globular lens, such contact is easily affected. The disintegration thus brought about in the lens substance causes a lowering in the intra-capsular pressure in the affected area; so removing the restraining influence which the intra-capsular pressure exerts on the proliferating activity of the capsular epithelium, and allowing of its irregular multiplication.

The fact that similar changes in the lens are excited by contact with it of a sarcomatous growth of the ciliary body favours this theory. The congenital anterior polar cataracts can be accounted for in accordance with it by imagining the apposition of the lens and cornea which normally exists for a part of fœtal life to have been abnormally prolonged, after the

*_Trans. Ophth. Soc. of U.K._, Vol. XII, p. 89.

†_Trans. Ophth. Soc. of U. K._, Vol. XVIII, p. 124.

disappearance of the fibrovascular sheath which supplies the lens with nutriment in its early stages.

The mass of proliferated capsular epithelium, which is at first met with in an anterior polar cataract, gradually becomes converted into a condensed mass of tissue showing only a slight lamination, and studded here and there with a few flattened elongated epithelial cells which have retained their nuclei. Beneath such a mass, epithelial cells, continuous with those lining the capsule in the unaffected parts, gradually insinuate themselves, separating it off from the adjacent lens substance. In an anterior polar cataract of seven months' formation I found a continuous layer of such cells on the posterior surface of the laminated mass, at the margins of which the hyaline capsule and its lining epithelium appeared to part company, the former passing in front and the latter behind.

In the course of time, in front of the epithelial cells which pass behind the laminated mass, a hyaline layer, similar in all respects to the lens capsule, makes its appearance. In an anterior polar cataract of 11 years' formation I found the laminated mass continued between two unbroken layers of hyaline capsule, both of which were continuous with the capsule in the unaffected region at the sides, the posterior of the two being alone lined by epithelium. That this new hyaline layer of capsule is the product of the epithelial cells which have crept in beneath the laminated mass seems to me an irresistible conclusion.

Anterior polar cataract occurs most frequently in infancy long before the lens has attained its maximum dimensions and density. As age advances, new lens fibres are laid on laterally, which, extending backwards and forwards, separate what were for a time the most peripheral fibres away from the capsule. As already stated, in anterior polar cataract, besides the proliferation of the capsule cells, there is some degeneration of the lens fibres. These are at the extreme periphery of the lens at the time the degeneration takes place; as new lens fibres are developed, the disintegrated area and the laminated mass formed from the proliferated cells, gradually become separated by them. So that, in an anterior polar cataract of long duration, two opacities are often seen, the one at the surface of the lens, the outcome of the proliferated epithelium, and the other some little depth down, due to degenerated lens fibres. I have recorded the details of seven cases in which two such opacities were observed clinically, and also the description of one lens in which they were found pathologically. The latter was the case to which I have already referred, where the anterior polar cataract had been of 11 years' duration. At the anterior pole was a laminated mass of tissue enclosed between two hyaline layers of capsule, the posterior of which was lined by cells, then came some layers of healthy-looking lens fibres and beneath them, at some little depth in the

lens, was an area where the fibres had broken up into irregular granules and detritus. This latter corresponded fairly accurately in size and extent to the anterior laminated mass.

In some of the cases seen clinically with two opacities the separation has not been complete, a thin band cementing them together, so that they presented much the appearance of a collar stud. Presumably in such cases the apposition of the ends of the lens fibres which have grown forwards from the sides has not been completely effected, some granular material having remained interposed in the line of suture.

Taking it now that the evidence brought forward suffices to show that the lens capsule is the product of the epithelial cells lining it, it is obvious that the posterior part of the capsule has only a very short time in which it can be formed, for the cells which compose the posterior layer of the lens vesicle soon lengthen out into lens fibres, and then become separated from the lens capsule by the growth around them of the new lens fibres laid on laterally; the posterior capsule for the remainder of life being devoid of any cellular lining. Under these circumstances it is not surprising that defects in the development of the central part of the posterior capsule should occasionally be met with, causing it to be unduly thin or absent altogether.

Several cases have now been recorded in which a congenital gap in the posterior capsule of the lens has been found. The first of the sort, so far as I am aware, was in a specimen which I described and pictured in 1892.* It was the right eye of a child, 9 months old, in which a peculiar appearance had been first noticed when 3 weeks old. This was found on examination to be due to a grey reflex at the posterior part of the lens with a large hœmorrhage on its surface. It suggested the appearance of a gliomatous growth, and the eye was consequently excised. Pathological examination showed that there was no new growth, but an opacity at the posterior part of an otherwise clear lens with a reddish stain on its surface. No remains of any central artery of the vitreous was to be seen. In microscopical sections of the eye passing through the pupil, the anterior capsule of the lens appears normal, it is lined by a single layer of cells which terminate as usual in the nucleated zone. On tracing the capsule backwards from the nucleated zone it is seen as a normal capsule for some distance; then at the posterior pole it is for some distance entirely absent. In the gap where it is absent, and for a short distance in front and behind the capsule on each side of it, there is a mass of tissue composed of elongated nucleated cells and fibres. This tissue forms the anterior part of the vitreous with which it is continuous. It resembles what Hess has described as atypically developed vitreous, *i.e.*, mesoblast which should have developed

* *Royal Lond. Ophthal. Hosp. Reports*, Vol. XIII, p. 363.

into vitreous humour, but which has formed a fibro-cellular tissue in place of the usual vitreous structure. When this takes place some of the blood-vessels of the fœtal vitreous usually persist. In this specimen no blood vessels are seen in the mass of tissue at the back of the lens, but there are collections of red blood corpuscles in the posterior part of the lens immediately in front of it. This hæmorrhage must have come from a branch of the central hyaloid artery before it disappeared. An attempt seems to have been made in this case to compensate for the failure in development of the posterior part of the lens capsule by atypical development of the anterior part of the vitreous.

The eye which contained this lens immediately after its excision was placed in Müller's fluid and hardened in a way which usually allows of the fibres of the lens, even in the fœtal eye, being shown in sections in a good state of preservation. In the sections of this lens, however, the fibres appear to be everywhere much shrunken and to form a sort of network with a mesh between them. The nuclear fibres remain adherent to the posterior pole. The cortical fibres are seen at the sides and have extended forwards round the anterior surface, but have not extended backwards around the fibres developed from the cells of the posterior layer of the vesicle. In the centre of the lens in front of the nuclear fibres is a quantity of coagulated, hyaline, albuminous material. Two cases, in some respects very similar to this, were described by Parsons in 1902,* and he has kindly allowed me to have drawing made from his sections of them. The first specimen was a congenitally small eye, which showed clinically a yellow reflex behind the lens and some opacities in the cortex. It was removed when the child was 10 weeks old and hardened in Mann's solution.

The following is the description of the microscopical appearances of the lens given by Parsons :—

"Lens: anterior capsule normal; the cubicle cells are continued round the equator, and line the peripheral parts of the posterior capsule; the central parts of the posterior capsule are wavy and apparently broken up by the tissue which covers the posterior surface; the peripheral parts of the posterior capsule are thickened and very wavy on one side, as if retracted. The cortex of the lens is maldeveloped, showing swollen, nucleated cells and fibres arranged irregularly. The nucleus is homogeneous, containing some aggregations of small cells with deeply-stained nuclei. Behind the lens, and in apposition to it, is a lens-shaped mass of very dense and cellular connective tissue extremely richly supplied with blood vessels."

Parsons' second case also had atypical development of the anterior part of the vitreous, a congenital gap in the posterior capsule of the lens, and a persistent hyaloid artery. The nucleus of the lens in this case was well developed, but from the

* *Trans. Ophth. Soc. of the U.K.*, Vol. XXII, pp. 253 and 258.

way it had stained was sharply differentiated off from the cortex. Parsons' description of the lens in this case is as follows: "Lens fibres and anterior capsule normal. The posterior capsule is replaced by a layer of fibro-cellular tissue, which is continuous with similar tissue forming the suspensory ligament, and with delicate fibres running into the vitreous. The capsule behind the equator of the lens is much thickened, and is wavy posteriorly, where it dwindles away and disappears in the cellular tissue. In sections near the periphery of the lens it is seen that the lens fibres overlap the irregular margin of the gap in the capsule, and here the fibro-cellular tissue is much thicker."

Having, from these cases, become aware of the not uncommon association of these defects, I was led to examine sections which I had previously prepared with persistent hyaloid artery and atypical development of the vitreous. I found that in those in which I had sections passing across the centre of the posterior pole of the lens a gap in the posterior capsule was present. In those which I had only sections passing through the side of the lens there was some rucking of the posterior capsule, suggestive of the possible presence of a defect in the centre.

So frequent is a congenital formation of fibrous tissue met with in association with a defect in the posterior capsule of the lens that I am inclined to think that the latter is the primary condition, and the former a kind of compensatory change.

In the first case which I described of congenital gap in the posterior capsule, I mentioned that some of the atypically developed vitreous lay just inside the capsule at the margins of the gap. In the next two cases I am going to refer to there was a much more extensive protrusion forwards of this fibrous tissue, of mesoblastic origin, into the cavity of the lens capsule.

The affected eye in one of these two cases was removed from an infant, aged 3 months. The mother stated she had noticed in it two small white specks at birth, which had gradually become larger and covered the sight. There had been no discharge from the eye and no inflammation. On examination, the iris was found to be in contact with the cornea, there being no anterior chamber, and the pupil was blocked by a greyish opacity. The eyeball was removed under the supposition that it contained a new growth, but none was found on pathological examination. A persistent and patent hyaloid artery extended throughout the vitreous ending and breaking up in a mass of fibres and elongated cells at the back of the lens (atypically developed vitreous). In anterio-posterior sections through the centre of the lens there is a break in the continuity of the posterior capsule at the posterior pole. On each side of the break it is seen to taper off and become merged with the mass of fibro-cellular tissue. In sections passing a little to one side of the posterior pole no gap in the posterior capsule is seen, but it is lined like the anterior by a single row of cells on its inner surface.

(*To be concluded.*

ON A LITTLE-KNOWN TYPE OF AMBLYOPIA IN CHILDREN.*

BY

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A child is sometimes brought for advice on account of poor sight, often discovered for the first time during early school life. In the hurry of an out-patient department, it may happen that the underlying condition is assumed to be one of ordinary ametropia. The relative visual acuity is probably recorded, and atropine is certainly prescribed for home use. Later, a careful estimation is made of the child's refraction. It is then found that the absolute visual acuity, despite correcting glasses, can perhaps be brought no higher than one-third or one-half normal, while the optic discs are greyer than they should be. The ophthalmoscopic condition, in short, is one familiar to every physician as "post-papillitic" or "post-neuritic" atrophy. The atrophic changes, nevertheless, are not complete, and may, indeed, be so slight as to escape recognition in the absence of careful ophthalmoscopic examination. In the cases which it is the more particular object of this communication to describe, the appearances are best characterised as those of "incomplete post-papillitic atrophy of the optic disc." They are, so far as I have seen, invariably bilateral, although possibly sometimes more pronounced in one eye than in the other.

Enquiry into the patient's personal history often elicits the fact that, when an infant, there had been a "cerebral" or "meningitic" illness, marked by such symptoms as "fits," convulsions, headaches, vomiting, constipation, retraction of the head, temporary paralysis, squint, unconsciousness, and so forth. On recovery from the attack, sight was found to be partially or totally lost, but has since been more or less regained.

The conclusion is almost inevitable that an infantile meningitis or encephalitis was accompanied by optic papillitis, and that both the general and local condition had to some extent been recovered from. The incomplete optic atrophy, seen later by the ophthalmic surgeon, then, is on this view to be regarded as a sequel to the meningitic papillitis.

The type of case indicated rather than described above must be carefully distinguished from two other kinds of temporary blindness, which may occasionally arise under somewhat similar conditions. The first, which I have described in the *Reports of the Society for the Study of Disease in Children* for 1902, as "Fleeting Amaurosis," and the second, "Post-Eclampsic

* Read at the Provincial Meeting of the Society for the Study of Disease in Children held at Birmingham on June 20th, 1908.

Amaurosis," described by Dr. Henry Ashby and myself in the *Reports* for the following year. The former is met with in infants suffering from basal meningitis, and sight under such circumstances appears to be wholly lost without ophthalmoscopic signs. In the further course of such cases the children often slowly recover both vision and health. It was to this particular class of case that Dr. William Gay proposed to apply the designation "Acute cerebral amaurosis of infancy" (*Royal London Ophthalmic Hospital Reports*, Vol. XIII, 1893, p. 404). The second class presents some points of resemblance to that just described, but the essential cause of the amblyopia appears to lie in convulsions, lasting for some hours, days, or even weeks. When the child regains consciousness, he is found to be blind without ophthalmoscopic signs, and as accompaniments may be noted aphasia and hemiplegia of a temporary or of a more lasting type. It will be objected that convulsions are merely accidental complications of many pathological states, and this is doubtless true, but the point upon which Dr. Ashby and I insisted was that the convulsions themselves were the actual cause of the blindness. We suggested in our joint communication that the nerve-storms might involve the visual cortical centres as well as the Rolandic motor centres or the speech centre, and the period of discharge be followed by a period of exhaustion. We published five such cases of what we ventured to call "Post-Eclampsic Amaurosis" in which the patients made a more or less complete recovery.

From what has been said it will be obvious that the distinction between the several forms of amblyopia mentioned in the course of this paper can be established only by ophthalmoscopic examination. In the acute cerebral amaurosis and in the post-eclampsic cases the optic discs show no changes, whereas in the other class they exhibit incomplete atrophy. The distinction, then, can be difficult only when a child is so young as to resist anything like a full ophthalmoscopic examination of the eyes.

Case No. 1.—*Imperfect sight in a girl of* 11 *years, due to an attack of meningitis, or encephalitis, entailing optic atrophy (incomplete) four years before she fell under notice.*

Helena, C———, 11 years, brought to the ophthalmic department of the Evelina Hospital, London, on November 26, 1907, on account of poor sight. No personal or family history of syphilis. No family history of defective sight. R.V.=6/12 and No. 1 Jaeger. L.V.=6/12 and No. 1 Jaeger. Pupils 4.5 mm., responsive to light (direct and indirect action) and to convergence. Fields for white showed insignificant concentric contraction. A week later, the eyes then being under the influence of atropine, with the total hypermetropia corrected (0.5 D.), the vision of each eye could be brought to 6/9 vi letters. There was post-papillitic atrophy of each optic disc, somewhat more marked on the right than the left side. A history was obtained to the effect that at seven years of age the child

suffered for some seven or eight weeks from very severe headaches, as well as from bouts of vomiting, and that she was ill in herself.

Case No. 2.—*Amblyopia, nystagmus, and feeble-mindedness in a lad of ten years, in whom there was a history of meningitis at two years of age.*

George B———, 10 years, admitted to the Queen's Hospital for Children, London, E., on April 9th, 1908. Although he might be described as "feeble-minded," yet he was clean in his personal habits and not viciously inclined towards other children. R.V.=5/60 and No. 12 Jaeger. L.V.=less than 5/60 and No. 12 Jaeger. Pupils equal and active to light. Slight lateral and rotatory nystagmus. Refraction (estimated under atropine):—

R.V. 5/60 - 0·5 D. Sph. - 1·5 D. Cyl. 90° 5/60

L.V. 5/60 - 1·0 D. Sph. - 1.0 D. Cyl. - 5/60.

Optic discs in a state of incomplete post-neuritic atrophy. Their colour was dirty greyish-white, their edges were a little ragged, and the lamina cribrosa was not visible. Knee-jerks *plus*. No ankle-clonus. ? Babinsky. No ataxy. No stigmata of hereditary syphilis. The history was as follows: at two years of age, one night, the child developed what was described as a "screaming fit," and on the next day there was a definite "fit," which lasted twenty minutes. Since that time the lad has been subject to "shivering fits" and to "facial distortions" every few months.

Case No. 3.—*Amblyopia, nystagmus, squint, and feeble-mindedness in a child of seven years, who three years previously had suffered from meningitis.*

Albert H———, aged 7 years, was first seen at the Ophthalmic School, at Hanwell, on February 21st, 1893. He was bad-tempered and feeble-minded, and his speech was difficult to understand. Nystagmus was present. The sight was defective, but the lad was certainly able to count fingers at a distance of twenty feet. Both optic discs were incompletely atrophic. Upon enquiry, it was ascertained that about three years before the lad came under my notice, at a time when he was about four years of age, he complained of headache, lost the power of walking, and developed a marked tendency to vomit. His head was held stiff, his left eye squinted inwards, and there was a discharge from his right ear.

The lad remained under my observation until he was twelve years of age. On July 18th, 1898, the sight in his right eye was equal to about one-half normal and that in his left eye to about one-fifth of the normal. The left eye tended to diverge. Fixation was imperfect. Colour-blindness was present. The state

of the optic discs was as noted previously. What I took to be a large haemorrhage undergoing metamorphosis was present in the central region of the left fundus oculi.

Case No. 4.—*Incomplete optic atrophy and convergent squint in a young child who three months previously had been affected with an illness diagnosed as meningitis.*

Arthur J. M————, aged eighteen months, was sent to me on January 18th, 1894, by Dr. C. E. Adams, of West Norwood. The history was that three months before coming under my notice, the baby became ill, was drowsy, and did not care for his food. The condition gradually became worse. The child suffered from pain in his head, was convulsed five or six times a day, his neck was stiff and his head retracted. There was, however, no vomiting. The right eye squinted inwards. The sight, which was good before the attack, seemed to fail in the third week of the illness. The latter, diagnosed by Dr. Adams as meningitis, lasted about two months and a half. The patient was the sixth child, and was born at term after a natural labour lasting twelve hours. When I examined Arthur J. M————, he was found to be fairly well-nourished, with all his teeth except two. The anterior fontanelle was not widely open. The right eye had a large convergent squint, seemingly due to paresis of the external rectus muscle. The pupils dilated readily to homatropin. The optic discs were sharply-defined and somewhat white. The child retained just sight enough to move about without running into the furniture of my consulting-room.

Case No. 5.— *Nystagmus, squint, and incomplete post-papillitic atrophy of the optic discs in a child of twenty-one months, seen five months after an attack believed to be one of meningitis.*

Marjory B————, 21 months, first seen on May 6th, 1908. She had been healthy until towards the end of the first week in December, 1907, when she was convulsed for twenty-four hours and became "stiff." Power was then lost—first, on the right and, then, on the left side of her body. No vomiting. The head was markedly retracted. The baby was "quite paralysed" for two weeks. Her temperature was 105°F. on end for several days. Enemata were necessary on account of obstinate constipation. Inflammation of both lungs and bronchitis then supervened and lasted for seven days. During recovery from pneumonia the child is stated to have gone completely blind, but this symptom probably preceded the onset of the lung mischief. After the illness had lasted for some weeks, the baby then began to recover her sight, the first object she saw being a tan shoe lying at the foot of her bed. Further improvement took place during the voyage from the Cape to England, which began on April 6th, and has continued since arrival in this country towards the end of April. The baby's eyes were first noticed to squint and to roll about when sight

began to be regained. *On examination.*—Pupils 3mm., with but slight response to light. Slight rotatory nystagmus. Optic discs pallid. Notices objects fairly well. Child walks fairly and talks well. Power over legs (lost during illness) almost regained.

Remarks.—The cases show that an attack of meningitis (or encephalitis) may entail as permanent evidence of its former existence: 1. incomplete optic atrophy; 2. nystagmus; and 3. paresis of one or more of the extrinsic muscles of the eyeball. The symptoms, it will also be seen, may occur as isolated or grouped phenomena. In the last case to be quoted, paresis of extrinsic muscles was the only evidence of a former meningitis.

Case No. 6.—*History of meningitis at six months, followed by paresis of abduction in both eyes.*

Donald W———, *ætat.* 6 years, brought on June 2, 1906, on account of defective sight. Vision was almost normal on correction by suitable glasses of the compound hypermetropic astigmatism that was present. The fundi showed no departures from the normal. The movements of the external recti muscles were obviously defective, so that the outward excursions of the eye were neither full nor well maintained. On seeking for a cause for this anomaly (which clearly might represent a congenital defect), it was ascertained that when about six months old, the child had been ill for three weeks, suffering from vomiting, incessant moaning, rocking movements of the head, and a high temperature (over 105° F. on several occasions). His father, a medical man, thought the attack was one of meningitis, a view concurred in by another experienced practitioner who was called in. But when recovery took place, the symptoms were put down to influenza.

In conclusion, I desire to state plainly that the present communication lays no claim whatever to originality. The existence of cases such as those I have described has been known for many years to some observers, although, so far as I am aware, they have not yet found their way into text-books, whether of general medicine or of ophthalmology. For example, Mr. Edward Nettleship published in 1883 (*Transactions of the Ophthalmological Society of the United Kingdom*, Vol. IV, 1884, p. 243) a communication "On cases of recovery from Amaurosis in Young Children." Of the nineteen cases of which notes were given in that important communication, Nos. 6 and 9 appear to belong to the group I have ventured to describe on this occasion. In a later contribution (*Royal London Ophthalmic Hospital Reports*, Vol. XI, Part 4, July, 1887) the same distinguished observer requoted two of the cases alluded to in his former paper.

CLINICAL MEMORANDUM.

AN ALBINO FAMILY.

BY

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OPHTHALMIC SURGEON, COVENTRY AND WARWICKSHIRE HOSPITAL.

I have lately examined a family in which three children out of four are albinos.

The father and mother are first cousins; the father has almost black hair and blue eyes, the mother has brown hair and eyes.

The first child is a girl, E.K., aged 7 years. She is a well-marked albino with almost white hair, and a pink iris and pupil. There is very pronounced lateral nystagmus. The child is sensible and bright.

V.R. = 3/50	− 3·5 cyl.	or − 2·5 cyl. = 5/50
V.L. = 3/50	− 2·5 cyl.	or − 1·5 cyl. = 5/50
− 3·5		− 2
− 0		+ 0·5

Retinoscopy under atropine.

The second child, a boy, C.K., aged 5 years, is not an albino; he has brown eyes and hair. He is, however, markedly astigmatic.

+ 1·5	+ 0
— + 3·5	+ 3·5

Retinoscopy under atropine.

The third child is a girl, L.K., aged 4 years. She is an albino, but has no nystagmus. She also has about two dioptres of myopic astigmatism. The child is a partial idiot, and appears to see very little. There is a small posterior polar cataract. The child is too fractious to enable an exact retinoscopy to be made, or to allow an adequate ophthalmoscopy. Her hair is quite white, as are the eyebrows and eyelashes.

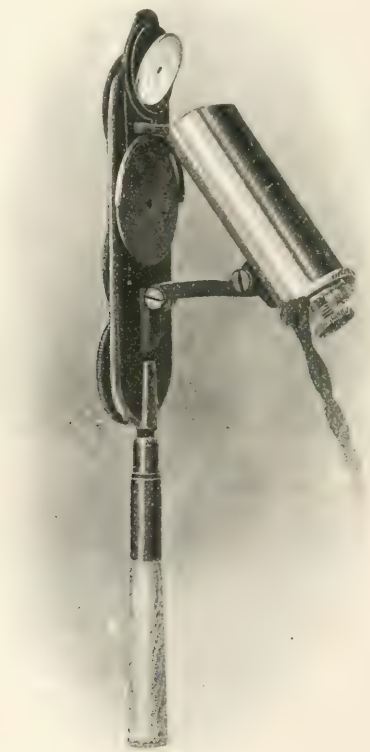
The fourth and youngest child, F.K., a boy, aged 2 years, is an albino, and has slow lateral nystagmus. He is backward in walking and talking, and seems to be "queer" in his ways.

There are no albino relations on either side of the family.

NOVELTIES.

PORTABLE ILLUMINATIVE ATTACHMENT FOR THE OPHTHALMOSCOPE.

The accompanying illustrations represent a new portable illuminative attachment for the ophthalmoscope, designed and shown at the meeting of the Ophthalmological Society on May 7th by Dr. Clements Hailes, of Clifton, Bristol.



When in action it throws a beam of parallel rays on to the mirror of the ophthalmoscope, giving a bright, clear, steady, light which, moving with the instrument, allows examination to be made in any position by the direct or indirect methods equally well in the ophthalmic surgeon's consulting room or at the patient's house.

If he have this attachment affixed permanently or by the clip provided on to his ophthalmoscope, the surgeon is rendered independent of all other sources of artificial light, whether in town or in the depths of the country. By means of a double jointed bracket, the attachment can be placed in many positions and thus is available for focal illumination or any other process where a bright beam of light is required, and the lamp will fold against the ophthalmoscope for carrying.

The attachment is connected by a flexible cord to an accumulator capable of maintaining the light for twenty hours consecutively, and so prepared as to be unspillable, there being no free liquid in the cell.

It is contained in a neat leather case measuring 6 ins. by 3 ins. by 1 in., with strap handle for carrying, and can be easily carried in the pocket or hung over the knob of a bedstead or chair or placed anywhere convenient when in use. The mirror should be tilted towards the handle of the ophthalmoscope and kept there, no matter whatever position the Ophthalmoscope may be used in, as the light moves with it.

The ordinary small concave mirror answers all purposes for direct or indirect methods, also for retinoscopy.

The attachment is made by Messrs. King and Company, scientific instrument manufacturers and electricians, of Park Row, Bristol. The attachments may be had for seven days' trial free on application to the above. The price of the attachment, with accumulator complete, has been fixed at £2 2s. 0d.

AN IMPROVED TINTED GLASS, "CHLOROPHYLLE," FOR EYE PROTECTORS AND SPECTACLES.

Messrs. J. B. Jacquemin Bros., Limited, of 65, Hatton Garden, E.C., have submitted to us a new protective glass, known as "chlorophylle," which is recommended in cases where protection is required for the eyes and yet where clearness of sight must not be seriously interfered with. Thus, the new glass is suggested for the use of cyclists, motorists, engine drivers, fishermen, gunners in the services, and so forth. The particular colour of the new glass was arrived at after experiment by Dr. Fargier, whose work was based upon the earlier suggestions of Dr. Fieuzal (1880). In fact, the chlorophylle coloured glass is to be regarded as a perfected type of the yellow-green glass introduced by Fieuzal. It can be obtained from retail opticians in a graduated series of depths from light to dark and with due proportions of green and yellow in the admixture of the glass in each graduation of colour. There are three degrees, numbered 1 to 3, 1 being the lightest and 3 the darkest in the series. The following are the percentages of light transmitted by the three series of glasses:—No. 1, 70 per cent; No 2, 55 per cent.; and No. 3, 30 per cent. It is claimed by the manufacturers that the "chlorophylle" glasses give:—(a) an agreeable sensation of restfulness to the eyes when exposed to bright light; (b) abundant luminosity; and (c) remarkable clearness of vision, which enhances plastic effect.

TRANSLATION.

THE TREATMENT OF INCIPIENT CATARACT WITH POTASSIUM IODIDE.*

BY

DR. V. PFLUGK,

OF DRESDEN.

Translated by ROSA FORD, M.B. (LOND.).

The much discussed question as to whether it is possible by any means to check the further development of opacity in a cataractous lens and to clear up opacities already formed has been answered by Professor Badal, of Bordeaux, in No. 34, 1906, of *Province Médicale*: "Je n'ai jamais cherché à guérir les cataractes complètes, mais j'ai essayé d'arrêter le développement des opacités commençantes et je crois y avoir réussi."

Among German authors, in the latest literature, Arlt, in particular, has expressed himself convinced of the possibility of clearing up lenticular opacities which have already progressed to a certain degree, but he also has felt himself obliged to meet expected objections, and writes at the end of the chapter on medicamentous clearing up of commencing cataracts, in which he reports a case observed by himself, where the lenticular opacity cleared through potassium iodide ointment and a drink cure: "I do not overlook, whilst I write this, that many readers will suppose a deception here. Only one's impartial and persistent tests can here lead to conviction; *à priori* the proofs cannot be denied in such cases."

Since Badal in the August number, 1901, of *La Clinique Ophtalmologique* began his publications on the treatment of commencing cataract—by which is evidently meant the early stage of the grey cataract which in the overwhelming number of cases occurs in the form of subcapsular cortical cataract—with potassium iodide, a whole series of his countrymen, as Dufour, Etiévant, Dransart, Picquénard, Boisseuil, Lafon, as well as Verdereau in Barcelona, have confirmed his results, and made them more widely known, so that in France every text-book of therapeutics mentions Badal's potassium iodide treatment. In the same way Badal's teaching has forced its way into the German-speaking countries in spite of almost universal incredulity.

In 1904 Verdereau endeavoured to prove by means of experiments with animals that lenticular opacities, experimentally produced, were cleared up by injections of potassium iodide

From *Medizinische Klinik*, 16 Februar, 1908.

solution. I have, since 1904, taken up Badal's treatment with eye baths and drops, but I speedily became convinced that the activity of the potassium iodide solution injected under the conjunctiva far surpassed the action of baths and drops—Badal's treatment of the French. Although the observations of v. Ulri and Frezal should establish the fact that, after an eye bath, just as much potassium iodide is absorbed into the eye fluids as after a subconjunctival injection of a solution of potassium iodide of the same strength, yet it does not by any means follow that the potassium iodide reaching the eye in so many different ways must exercise the same action upon the contents of the eyeball.

In my work in Graefe's *Archiv für Ophthalmologie*, Bd. 67, Nos. 2 and 3, "The Influence of Potassium Iodide on Incipient Cataract," I have published detailed observations of experiments which I have undertaken, which show that potassium iodide is able to exercise a protective influence on the epithelium of the lens-capsule in napthalinised rabbits. I have been successful in showing that naphthalin introduced in the form of a 10 per cent. emulsion into rabbits by the stomach-sound destroys, in the first place, the epithelial cells lying over the anterior lens radius; but since the reaction with palladium chloride showed that, in the same place in the anterior lens radius, potassium iodide enters the lens in a pre-eminent degree, and that with a coincident action of naphthalin and potassium iodide the epithelium in this situation is protected from the damaging action of the naphthalin derivative, I consider myself justified in ascribing the protective action to the potassium iodide entering into the lens. In the second place, I have been successful in showing by experiments on animals that potassium iodide injected beneath the conjunctiva hinders the proliferation of the capsule-epithelium during the development of lens opacities. Experiments on the action of potassium iodide on normal and pathologically altered lenses have been carried out by me on a large number of animals (in all, on 96 rabbits, 14 cats, 6 dogs, 5 guinea-pigs, 3 apes and 81 frogs), and these gave in all essential details exactly similar results.

Badal treated commencing lenticular opacities exclusively with potassium iodide eye baths (7·5 : 300) and instillations (0·25 : 10·0) and has published the results in several journals; the same method was used by Dufour, Etiévant, Picquénard, Boisseuil, and Lafon; Verdereau preferred subconjunctival injections of 5 per cent., and, later, 2½ per cent. potassium iodide solution. I have in all advanced cases employed exclusively injections, using the following solution :—

Potassium iodide - -	0·1
Sodium chloride - -	0·2
Distilled water - -	10·0

The painfulness of the potassium iodide injections first described by Badal, and later confirmed and depicted by

Verdereau (even with the use of cocaine and acoin additions to the solution) I have transmuted through anæsthetising the conjunctiva with 3 per cent. cocaine wood tampons, into complete painlessness. In addition to this, during the last few months, by means of the acoin oil of the firm of v. Heyden, I have succeeded, even in especially sensitive patients, in obviating the after-pain, without damage to the eyes. I give every week about 2-3 injections of ½-1 Pravaz syringe, according to the condition of irritation of the conjunctiva in the way which I have fully described in my work in the *Klinische Monatsblätter* (1906, Bd. 44, S 400 ff). By means of some rather laborious work I have been successful during the last few months in collecting an almost complete table of all the cases published of potassium iodide treatment of commencing cataract since Badal's work in 1901. I give here only a general survey in percentages of the results which have been fully described elsewhere.

Authors.	Eyes tested.	Great improvement. per cent.	Improvement. per cent.	Stationary. per cent.	Worse. per cent.
1. Badal ...	18	—	6	88	6
2. Badal ...	100	10	16	58	16
3. Various ...	18	11	33	56	—
4. Verdereau...	48	45	49	6	—
5. v. Pflugk ...	55	53	33	14	—

In all 239 cataractous eyes treated with potassium iodide.

No. 1 are Badal's first published cases in the years 1901 and 1902 (Therapie : Traitement Badal).

Under No. 2 appear the last series of 50 patients from Professor Badal's private practice ; published in the dissertation of Boisseuil, 1906 (*Thèse de Bordeaux*) ; the same treatment.

No. 3 are the isolated cases scattered through the literature and include those of Etiévant, Dransart, Picquénard Caralt, Palma (treated by Badal's plan, sometimes with injections 5%).

No. 4 are Verdereau's cases collected from different works (injections 5 per cent. and 2½ per cent.) ; and

No. 5 are my own 30 cases of commencing lenticular opacities, which I treated with potassium iodide and was able to watch for various lengths of time (one for four years). I have to thank, almost without exception, the use of the 1 per cent. injections above described for my favourable results.

The 5 per cent. and 2½ per cent. potassium iodide solutions recommended by Verdereau I have discarded for different reasons ; above all, because high percentage solutions seemed to me according, to experiments on animals, to be not without danger for the lens-epithelium ; secondly, the further trials of Verdereau's *technique* by Santo Fernandez have shown that 5 per cent. solution speedily produces an emptying of Tenon's

space; and, finally, the use of this high percentage potassium iodide solution produces almost unbearable pain, so that Verdereau himself reports that a number of patients were not to be persuaded to permit more than one injection.

What, then, does this survey of all the published cases of potassium iodide treatment of commencing lens opacities teach us?

It follows from the foregoing that the potassium iodide treatment is able to produce essential improvement in acuity of vision in cases in which, up to now, improvement could be gained by no other sort of treatment, and which, up to now, have been helplessly given over to the knife of the operator.

Hess said: in 1905, "The possibility of the actual clearing of clouded parts of the lens seems to many people, even to-day, very doubtful. Although such cases in senile cataract are certainly extremely rare, yet, as I believe, no further doubt can remain of their occurrence."

The table further shows that Badal, with the *technique* which he used (baths and instillations) obtained improvement in 6 per cent. and later in 16 per cent. but that it was possible to him in a large number of cases (88 per cent. and later 58 per cent.) only to cause the lens opacities to remain stationary.

The published results of Verdereau and myself are quite different. Since I have collected the largest series of cases in which the eyes were treated by injection of potassium iodide, I venture to oppose my figures to those of Badal.

By the use of 1 per cent. potassium iodide injections it has been possible for me to obtain in 86 per cent. improvement, whilst 14 per cent. remained stationary. Neither Verdereau nor myself had a single case which became worse, and I had only a few (14 per cent.) which remained stationary, as opposed to 88 per cent. and 58 per cent. of Badal's cases.

In my publication in the *Klinische Monatsblätter für Augenheilkunde*, I recommended injections with potassium iodide as a valuable means, which one is justified in using in certain conditions, as, for example, in one-eyed people, loss of one eye through enucleation, unconquerable fear of the operation, and internal diseases, which might make an operation difficult or impossible, such as cardiac weakness, asthma, etc., etc.

On the ground of numerous and repeated observations during the course of a year, and by reason of the harmlessness and simplicity, already insisted upon by Badal in particular, of the baths and instillations, I consider it advisable that every patient with commencing cataract, who consults us on account of diminished vision, should not at once be directed to the necessity of operation, which for by far the greatest number of patients offers

a continual source of care and uneasiness—but that he should be ordered, after Badal, eye drops (a few drops daily, twice or three times, potassium iodide, 0.25 : 10·0) or eye baths (twice or three times daily, potassium iodide, 7.5 : 300, using the eye bath for three minutes).

On the same day on which I write, an old lady of 90 years came to consult me with the early onset of cataract in both eyes. I may say that it has given me a sincere internal satisfaction that I was not obliged to embitter the end of the old lady's days by the prospect of an operation, but that I have, with the help of the potassium iodide treatment, the most reasonable prospect of preserving to the lady her sight for the rest of her life without operation, for, according to present experiences, which Badal has tested not only in 118 eyes, but in many hundred cases, and which I, so far as my experience reaches, can thoroughly confirm, I am completely justified in this hope.

If during the treatment with baths and instillations an increase in the opacities shows itself, then injections should be resorted to without delay, and for this treatment it is better for the patient to be in hospital. I do not believe that a single pure incipient cataract (sub-capsular form) without complications—choroido-retinal inflammation, general bodily illness—which is treated in the beginning with iodine preparations withstands in the end the influence of the treatment.

According to Badal's experiences, which I must confirm, the potassium iodide is without influence in opacities of the lens nucleus, and it has also but slight influence in capsular cataract.

I have, moreover, in my experience up to the present, found no patient who has not submitted quite willingly to the iodine therapy, especially to Badal's treatment, and the associated inconveniences, chiefly that they must remain under medical control for only three months, are quite negligible.

Although I am aware of the extreme value of cataract operation, and just because in my nearly fifteen years' operative experience in my own practice I have acquired abundantly the necessary operative skill, I reflect on the often quite unsatisfactory results of extractions and the many and permanent inconveniences with which they are associated; the constant necessity of wearing convex glasses; the expense of the change of glasses often rendered necessary by the changes in the wound—astigmatism; the highly burdensome changes from near to distant glasses; the formation of a secondary cataract, often after years, with the necessity for further interference and its dangers. Added to this are the direct difficulties of the operations; the possibility of wound infection; the wound gaping; glaucoma; cystoid scarring; and, in older people, cardiac weakness, hypostasis, etc.

In face of these frequent extremely pressing difficulties, which call forth, indeed, in many a case from doctor and patient the feeling "it had been indeed better here if the knife had never been applied!", I hold the recommendation, so often repeated by Badal, to treat commencing cataracts with potassium iodide as one of the most blessed acquisitions of the last few years, and it is my sincere wish and my request to colleagues to contribute to the introduction and further perfecting of the potassium iodide therapy of commencing cataract. Only through comparison of the results obtained by different observers are we able to build up a new method of cure; but that the potassium iodide treatment of commencing cataract is valuable is shown, in addition to the experiments on animals, by the observations above quoted from the existing literature on the subject.

REVIEW.

SOME OF THE NEWER REMEDIES IN EYE WORK.*

BY

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During the last few years some important work upon the therapeutics of eye disease has been done, more especially perhaps by continental surgeons. Old remedies have been re-investigated; new remedies have been employed; and novel methods have been adopted. It may be of interest to glance at what has been accomplished in these several directions—to take stock, as it were, of some recent advances in ophthalmic therapeutics.

The Application of Remedies.

We may first discuss some of the newer methods of applying remedies.

Oily Collyria.—Of late years, more especially in France, considerable attention has been paid to the advantages of oily collyria—that is to say, the solution of alkaloids not in water, as is more usual in this country, but in oil of various kinds. The outstanding advantages of oily collyria are three in

* A lecture delivered in the Post-Graduate Course of Ophthalmology in the University of Oxford on 11th July, 1908.

number:—(1) they may be kept for many months without change; (2) they furnish a most unfavourable medium for the development of moulds or micro-organisms; and (3) they produce neither spasm of the orbicularis nor lacrymation when dropped into the eye. It has also been claimed that (4) they fail to set up dermatitis in cases where the same alkaloid dissolved in water has done so.

Scrini[1], of Paris, whose name is closely associated with the use of these collyria, has found by experiment that some oils, as olive, nut, and vaseline, produce no irritation when applied to to the eye, while others, as castor, almond, and neat's foot, have the contrary effect. The drawback to oil of vaseline is that it is incapable of taking up sufficient alkaloid. The media therefore recommended by Scrini are olive oil and nut oil. Before the oil is used, it must be carefully cleansed and sterilized. There are several ways of attaining these ends, but the following, recommended by Delacour and quoted with approval by Scrini, is apparently the best and simplest that can be adopted. It is as follows:—the oil is first washed for several days with half its volume of 95 per cent. alcohol, in order to free it from fatty acids. It is next decanted, and, if cloudy, filtered. Lastly, it is sterilized by being heated in a sand-bath for about ten minutes to a temperature of 120 degrees.

Daxenberger[2] has spoken highly of a 10% solution of aristol in sesame oil as a means of treating blepharitis, conjunctivitis, keratitis, and other superficial inflammations of the eye.

Some years have elapsed since Darier[3] pointed out that the pain of subconjunctival injections could be minimised or altogether abrogated by adding to the solution for injection a few drops of a 1 or 2 per cent. solution of acoine—that is, di-para-anisyl-mono-phenethyl-guanidine hydrochloride, to accord to the product its full chemical title. Darier's observation has been confirmed in some quarters and denied in others. But beyond this particular application acoine does not appear to have enjoyed any special favour as a means of relieving ocular pain. Recently, however, v. Pfluck[4] has extolled a 1 per cent. solution of acoine in arachis oil as a means of abolishing ocular pain, and his claims with regard to that point have been confirmed by Darier.[5] The analgesia produced by these means may last, so it is claimed, from twelve to twenty-four hours.

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Subconjunctival Injections.—Although subconjunctival injections have been before the profession for many years—indeed,

since they were recommended in 1866 by Rothmund[1], of Munich, for the purpose of removing leucomata—opinion is by no means unanimous as to the value of this method of applying remedies to the eye. More especially, perhaps, is this the case in Great Britain, where institutions can still be found in which the method appears to be unknown, or at least unpractised. So far as these particular places are concerned, Darier's very conclusive experiences[2] might never have been published.*

The exact method of action of the subconjunctival injection has never been altogether clear. To the reviewer it has always seemed that the precise agent employed is not so important as the liquid menstruum, for it is difficult on any other assumption to explain the cure of a given disease by using several different remedies. Elsewhere[3] he has suggested that the irritation produced by the injections causes an exudation from the vessels of the eyeball rich in albuminoids and protective substances from the blood, with the consequence that the aqueous humour becomes strongly hæmolytic. Some recent experimental work by Best[4] indicates that subconjunctival injections induce a definite effect as regards the metabolism of the retinal cells, as shown by a deposit of glycogen after they have been employed. T. Ballaban[5] has suggested that the injections act by inducing changes in the eye comparable with those brought about by inflammation. Protective bodies enter the eye from the blood-serum, and this, Ballaban believes, accounts for the good results yielded by injections in such affections as chronic irido-cyclitis, vitreous opacities and hæmorrhages, and inflammation of the retina and choroid. In Ballaban's experience, some twenty to twenty-five injections are usually necessary to obtain good results.

F. Maggi[6] has employed injections of quinine hydrochloride (1 to 400) with success in three cases of hypopyon-keratitis; of sublimate (1 in 5,000) in two similar cases, once with a good and once with a poor result; of sodium chloride (0·75 per cent.) once without success. Maggi concludes that quinine is the best agent to employ in cases of hypopyon-keratitis. This observation recalls the fact of A. Lawson's[7] observations as to the value of a quinine lotion (quinine sulphate, grs. iv; distilled water, ʒj) in cases of obstinate and intractable corneal ulceration. J. Lockhart Gibson[8], too, has insisted upon the value of bisulphate of quinine lotion in the treatment of hypopyon-keratitis, and so has Charles G. Lee [24].

One objection constantly urged against the employment

*Mr. R. Marcus Gunn in his presidential address delivered before the members of the Ophthalmological Society on October 17th, 1907, made, however, the following statement: "A considerable amount of experience has now been gained in this country as to the efficacy of treatment by subconjunctival injections. It would be interesting to know the opinion of our members on this subject, and it might be a proper subject for a discussion or a report by a committee of the Society." (*Transactions*, Vol. xxviii, Fasc. 1, 1908, p. 12).

of subconjunctival injections is the pain they are apt to produce. This may doubtless be to some extent minimised by employing a very sharp needle, and, especially, by making the injection as far away from the cornea as possible. Darier's recommendation, namely, to add acoine to the solution for injection, has been already mentioned. A. Erb[9], who states that acoine employed in this way causes adhesions in the subconjunctival lymph-spaces, has adopted the following plan, whereby subconjunctival injections of 2 per cent. to 5 per cent. sodium chloride may be made painlessly :—one or two drops of a 10 per cent. solution of dionine are placed in the conjunctival sac, and in a couple of minutes this is followed by a few drops of a 4 per cent. solution of cocaine. Recent investigations by Scrini[10] indicate that the new local anæsthetic, stovaine, may be applicable under similar conditions. Subcutin may also be employed, and the reviewer is convinced that alypin is useful under the circumstances. Whatever plan be employed, it is important to make sure :—1. that the needle is sharp ; 2. that no instrument be used to the eye except the syringe ; 3. that a minimum quantity of fluid be injected ; and 4. that the injection be made as far away from the cornea as possible. It is, moreover, an advantage if the needle be constructed wholly of platinum, and be curved (as suggested by Dor *fils*), so as to reach the equatorial part of the globe more readily.

A tendency to employ only solutions of sodium chloride in subconjunctival injections is evinced in recent papers by Verderame[11] and Lamb respectively. The former author believes that cyanide of mercury, even when used in as weak a solution as 1 in 5,000, causes obstruction in the subconjunctival lymph-spaces. The addition of acoin was followed by the formation of cicatricial tissue in the conjunctiva. His conclusions were reached as the results of experiments on the eyes of guinea-pigs. These authors, therefore, have reverted to Rothmund's[1] original practice. Mellinger[12] was one of the first to call attention to the dangers of injecting sublimate, even in weak solutions. On the other hand, he found sodium chloride in 2 per cent. to 10 per cent. solutions equally efficacious and much less irritating. It must not be forgotten, however, that bad results have followed even the injection of sodium chloride. Thus, L. Alexander[13] after 5 per cent. to 10 per cent. injections, noticed in one case adhesions between conjunctiva and sclera ; in a second, localised necrosis of the conjunctiva and temporary disturbance in cornea and lens ; and in a third, lental and corneal opacities, of a fleeting character. Again, H. Villard[25] after the deep injection of 1c.c. of 10 per cent. saline, noted paralysis of the levator palpebræ superioris, which underwent spontaneous cure in about a fortnight. The injection was made for detached retina, and despite the complication noted, succeeded in curing that condition.

As regards other complications, such have been placed on record by Mazet[14] and by G. E. de Schweinitz[15] respectively after subconjunctival injections. Mazet saw acute glaucoma follow a couple of injections of sodium iodate, a remedy actually recommended by Darier in the treatment of glaucoma. de Schweinitz had a rise of tension, injection of the eyeball, steaminess of the cornea, reduction of sight, and great pain within half-an-hour of the injection of ten drops of mercury cyanide, 1 : 5,000. These untoward symptoms, however, lasted only for about five hours. The injection, it should be added, had been made for the relief of vitreous opacities, following uveitis.

Subconjunctival injections of sterilized air.—J. Terson[16], following the example set earlier by Koster[17] (1901), by Lemeignen[18] (1904), and by Chesneau[19] (1905), has employed subconjunctival injections of sterilized air in the treatment of tuberculous keratitis and of relapsing ulceration of the cornea. The plan consists in drawing air into a sterilized syringe through a thick wad of sterile wool, and injecting the contents of the syringe subconjunctivally in the same way as in the case of a solution. In a later communication[20] Terson *père* and *fils* speak of having employed this method of treatment in 38 cases of corneal ulceration, in 4 of interstitial keratitis, in 2 of sclerosing keratitis, in 2 of iritis with hypopyon, and in 1 of hypopyon following cataract extraction. In more than three-fourths of the corneal ulcerations the suppurative process was checked, the duration of the disease shortened, and the cicatricial opacities reduced to a minimum. Two of the cases of interstitial keratitis were improved, and two uninfluenced. The hypopyons were rapidly cured, and so were the cases of sclerosing keratitis. The Tersons consider that the treatment is very useful, either alone or in association with the usual local and general remedies. It has the dual merit of being at once simple and always to hand. H. Frenkel[21] has employed the method on a large scale, and his experiences are embodied in the thesis of his pupil, Farnière. Briefly, encouraging results were obtained in cases of phlyctenular kerato-conjunctivitis, zonular keratitis abscess of the cornea, central and marginal ulcerations of the cornea, and old ulcerations associated with pannus. The effect of the injections in relieving pain, photophobia, lacrymation, and blepharospasm was very marked. On the other hand, injection of air failed in interstitial keratitis, scleritis, and hypopyon-ulcer. It is to be noted that in many of Frenkel's cases other treatment, usually yellow ointment, was employed in addition to the injections of air.

Mitin: a new excipient.—Mitin, introduced by Jessner, is a white, soft, neutral substance, easily miscible with any other medicament. In dermatology it has been acclaimed as a bland and unirritating base that can be used either by itself or as a

vehicle for mercury, resorcin, or thigenol. Haass[22] and H. Viersen[23] have independently recommended the product as an excipient for eye ointments.

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The direct application of heat to the eye.—Several workers have devised methods for applying heat directly to the eyeball. For example, Ostwalt[1] has invented an appliance, called a "Thermærophore," which essentially consists of an elastic bulb, a spiral tube, and a shaped rubber cup (with attached thermometer) large enough to fit over the orbit. Fresh air is driven by the bulb into the spiral tube, which is placed over a Bunsen burner, and the air heated by these means is then forced into the rubber cup. The dry, superheated air can be borne at a temperature of 100°, 150°, or 175° C. Treatment, given once or, occasionally, twice a day, is continued for about half an hour. The apparatus is intended to be used by the patient himself. Golesceano,[2] on the other hand, attains a similar end by adopting a somewhat different plan. He applies heat to the eye by means of hot vapour. His apparatus consists of a dome-shaped boiler, connected with one branch of a double-channelled tube, of which the second branch is connected with a hand-bellows. Vapour from the boiler passes through the peripheral part of this tube, while cold air from the pump is forced through the central division. The vapour is led into a funnel-shaped mask fitted over the patient's orbit. The vapour has a temperature of 40° to 45° C. Applications number one to four daily, and are continued on each occasion for from five to ten minutes. Ostwalt and Golesceano agree in finding the direct application of heat (dry or moist, as

the case may be) useful in such superficial affections of the eye as blepharitis, phlyctenular keratitis, interstitial keratitis, and various forms of irido-cyclitis. Roughly, then, the applications are indicated for the relief of pain and for the cure of chronic inflammations of the eyelids, cornea, or uveal tract.*

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Local Remedies.

The following rough classification of the local remedies to be now described will render the subject simpler to follow:—1. anæsthetics and analgesics; 2. mydriatics and myotics; 3. antiseptics; and 4. miscellaneous remedies.

1. Anæsthetics and Analgesics.

Two new local anæsthetics, namely, novocaine and alypin, have been tried in eye work. Novocaine, a synthetically prepared product, with an appalling chemical formula, is quite distinct from cocaine. The muriate, the salt usually employed, is a crystalline powder, soluble in its own weight of cold water. The aqueous solution may be boiled repeatedly without undergoing decomposition. Wintersteiner[1], who still regards cocaine as the best local anæsthetic, concludes that novocaine, while devoid of irritating action, is less powerful than cocaine, while its effects last for a shorter time. As a 1 per cent. or 2 per cent. solution novocaine had been used in ophthalmology by Wicherkiewicz[2]. It appears to be a local anæsthetic pure and simple, devoid o action on pupil, accommodation, corneal epithelium, or tension. By its aid the enucleation even of a tender and inflamed eyeball can be carried out without pain. For this purpose, Wicherkiewicz recommends the following solution: novocaine, 0·125; suprarenin, 0·00016; sodium chloride, 0·225; distilled water, 25·00. Siegrist[3] has also used novocaine as a local anæsthetic during removal of the eyeball. He injects 0·75 of a 2 per cent. solution of novocaine, to which adrenaline is added, at each of the four chief meridians of the eyeball.

Schluter[4] conducted in Sattler's *klinik* some instructive experiments as to the relative value of novocaine and cocaine. The sensibility of the eyeball was estimated by means of fine hairs of different degrees of stiffness, which, when pressed against the cornea, exerted a determinable pressure. Solutions of each drug of 0·5 per cent., 1 per cent., 2 per cent., 3 per

* As the result of experiments on rabbits, C. H. Sattler (ref. in *Zeits. f. Augen.*, May, 1908, p. 497) found that as regards the protective bodies (anti-bodies, agglutins, hæmolysins) in the aqueous humour, treatment by hot air presented no advantages over ordinary warm fomentations. Subconjunctival injection of 4 per cent. sodium chloride or paracentesis was much more powerful in this direction.

cent., and 10 per cent. were tested, the cocaine being applied to one eye and the novocaine to the other. As regards the weaker solutions, cocaine was found to be more effectual than novocaine. With a 10 per cent. solution, on the contrary, the anæsthesia induced by novocaine was not only brought about more quickly but also lasted longer. Schluter regards novocaine as a possible substitute for cocaine in eye work. Verderame[21] points out that novocaine has lower anæsthetic power than cocaine, with the consequence that it must be employed in stronger doses. It causes changes in the conjunctival epithelium, but the absence of mydriasis gives it an advantage in operations for glaucoma. A charge has been brought against novocaine of delaying the union of the wound after cataract extraction, but it should be borne in mind that a similar charge was levelled by Mellinger against cocaine. It is likely that there is as small justification in the one case as in the other.

If novocaine has so far been little used in eye work, the contrary is the case with regard to the second local anæsthetic, alypin. This synthetic compound is a glycerin derivative, the action of which upon the eye has been investigated by v. Sicherer[5], Jacobson[6], Seeligsohn,[7] Hummelsheim[8], Ohm[9], Wibo[10], M. Landolt[11], Maynard[12], Zimmermann[13], Darier[14], Kirchner[15], Chevalier and Scrini[16], and many others. It occurs under the form of a white powder, readily soluble in water, and its solutions can be boiled without undergoing physiological deterioration. The reviewer recorded his experiences with a 2 per cent. watery solution of alypin in THE OPHTHALMOSCOPE for November, 1905. He had then made several hundred trials of the new agent, had employed it in many operations, and had formed a high opinion of its efficacy. In the course of about one minute (70 seconds as the average of 35 observations) the ocular and the palpebral conjunctiva, as well as the cornea, had become insensitive to touch, as with the tip of a twisted piece of damp cotton wool. A few seconds later, the ocular conjunctiva might be seized with fixation forceps without the least pain. An obvious distension of the superficial vessels of the eye was noted in 90 per cent. of the patients in whom the point was specially investigated. It was, however, transient. Alypin produced no changes as regards accommodation, corneal epithelium, tension, or pupil. Anything like pronounced smarting only followed the employment of solutions stronger than 2 per cent. Since the appearance of the communication named above, the reviewer has employed no local anæsthetic except alypin. He is thoroughly satisfied with its action under all circumstances.

Has alypin, then, no drawbacks? By M. Landolt[11] it has been stated that alypin, like cocaine, may affect the corneal epithelium, and by Kollner[17] and by Zhulebine[18] that it may

cause moderate dilatation of the pupil. Sommer[19] lays stress upon the discomfort and lacrymation caused by alypin, more especially in women and children. A. D. Griffith[20] reported a case of collapse after a couple of drops of alypin (grs. 2 to the ounce) had been placed in the eye of a young man. The attack described by Griffith, however, was clearly one of *petit mal*, the connection of which with the use of alypin, in the reviewer's opinion, is something more than merely problematical. The reviewer would emphatically state that he had never seen a bad result from 2 per cent. alypin, despite the fact that since 1905 it has displaced all other local anæsthetics in his practice.

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Dionine, the hydrochloride of ethyl-morphine, has now firmly established its position in ophthalmology, where it is employed for two chief purposes: first, as a most efficient means of relieving pain in such affections as keratitis, irido-cyclitis, and acute glaucoma; and, secondly, as a means of inducing absorption of corneal deposits, cyclitic products, lenticular remains, and so forth. Its action depends, as everybody now recognises, upon its peculiar property of inundating the tissues of the eye with lymph, and thereby augmenting and increasing the tissue-changes. T. Harrison Butler[1] has reported a case of cyclitis, due to pyorrhœa alveolaris, promptly and permanently relieved by 5 per cent. dionine. The atropine previously employed had failed,when used by itself,to alleviate the symptoms. Charles Markus[2] has related an equally striking case of cyclitis, where vision improved in three days from fingers at two metres to 6/12 and eventually to normal after the use of 10 per cent. and 5 per cent. dionine.

It is important to enquire whether bad results ever follow the application of dionine to the eye. Wray[3] reported temporary myosis after the application of 5 per cent. dionine in a case of

serous iritis, where the pupil was semi-dilated by atropine. A similar case has been mentioned by Suker[4]. In view of these facts, Wray comments upon the danger of prescribing the drug for home use. On the other hand, Senn[5] noted dilatation of the pupil after the use of physostigmine and dionine (10 per cent. ointment) in a case of chronic glaucoma, with the result that tension rose and visual acuity rapidly fell from 0·2 to 0·05. The same author saw great irritation follow the use of 10 per cent. dionine with scopolamine in a case of relapsing irido-cyclitis. Senn recommends circumspection as regards the use of dionine in glaucoma.

A special way of attemping to break down adhesions between the iris and the capsule of the lens resulting from iritis has been described by v. Arlt[6] and confirmed by Foerster[7]. Some powdered atropine is first applied to the eye, and a few minutes later, a little powdered dionine. The reviewer has had gratifying success with this plan. A combination of dionine with pyoctanin (methylene blue) has been found useful by Wicherkiewicz[8] in various suppurative conditions of the eye and neighbouring cavities. A 1 : 500 solution of pyoctanin is first applied to the eye, and dionine is then dropped in. The latter is used in increasing strength from sitting to sitting, on account of the well-known tolerance that is speedily established.

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(8) Wicherkiewicz.—*La Clinique Ophtalmologique*, mars 10 et 25, 1907.

2. Mydriatics and Myotics.

Euphthalmine, first investigated by Treutler[1], has now passed into current use in many cliniques, where a 2 per cent. to a 5 per cent. solution of the hydrochloride salt is employed for the purpose of dilating the pupil without causing any notable interference with the function of accommodation. An excellent formula for this purpose contains 2 per cent. each of euphthalmine hydrochloride and cocaine hydrochloride.

A new mydriatic, named eumydrine, which occurs as a white powder readily soluble in water, has been investigated by Erb[2], Goldberg,[3] and Lindenmeyer[4]. According to Goldberg, a 1 per cent. solution acts more promptly than atropine, 1 : 1,000, while its effects pass away more rapidly. As regards the central nervous system, eumydrine is stated to be 50 times less poisonous than atropine, from which, by the way, it is obtained. It is a trustworthy cycloplegic. Lindenmeyer found the new agent to be of service in such inflammations of the eye as would usually be treated with atropine. The reviewer has for some years

employed eumydrine in a solution containing from two to four grains to the ounce of distilled water, and has satisfied himself that it is a speedy, painless, and trustworthy mydriatic. It differs in two important respects from atropine; first, the paralysis of accommodation induced by eumydrin, instead of lasting for upwards of a week, as with atropine, usually passes off in the course of two or three days; secondly, its action, both upon the pupil and the ciliary muscle, may be neutralised in half an hour or so by means of a weak (0·5 per cent.) solution of physostigmine, which is not possible after atropine has been applied. The reviewer has been impressed with the fact that eumydrine is an excellent substitute for atropine when appearances of local intolerance towards the latter are present. He has met with several striking cases of the kind.

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The salicylate of physostigmine has been recommended by T. K. Hamilton[1] as a particularly suitable salt for prolonged use in chronic glaucoma. A substance named isophysostigmine, another alkaloid of the Calabar bean, has been investigated by a Japanese oculist, Ogiu[2]. That surgeon found that the drug acted more quickly upon the pupil, and with greater energy and for a longer period than physostigmine. The reviewer saw irritation follow the use for some weeks of isophysostigmine in a case of conical cornea. But there can be no doubt that the new agent is an efficient and powerful myotic. Behrens[3] experimented on animals, and found that isophysostigmine had a longer and more intense action than physostigmine. The only exception was in cats. Another comparatively new myotic, arecolin, has fallen under the reviewer's personal notice. It is one of the several alkaloids of the betel nut, and used as a one per cent. solution of the hydrobromide salt, has rendered service in glaucoma. By several observers, Lavagna[4] and Richardson Cross[5] among the number, it is considered to be the best myotic for general use. According to the younger Galezowski[6], however, even a half per cent. solution may cause irritation of the conjunctiva. Santos Fernandez[7], too, maintains that arecolin tends to cause shrinkage of the eyeball. On that account, in his opinion, it is contraindicated in useful eyes, but indicated in staphyloma and buphthalmia. Fernandez believes that it should be avoided in the treatment of glaucoma.

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3. Antiseptics.

Despite adverse laboratory reports, argyrol still retains its pre-eminence as an efficient and non-irritating antiseptic for use in superficial inflammations of the eye. Protargol, also, is still much used. Although the reviewer has personally never experienced the least trouble with argyrol, yet it is right to recall the fact that one or two surgeons have not been so fortunate. For example, Stevens[1] noted severe pain around the eye follow the employment of a 20 per cent. solution in gonorrhœal ophthalmia. Again, Post[2] after the injection of a 25 per cent. solution into the cavity left by the removal of a chalazion, found the entire lid become black and shining—" like a highly-polished stove-lid," to quote his graphic simile. Solutions of argyrol or protargol are most useful in the treatment of affections of the lacrymal passages, and may with advantage be syringed through the diseased parts. But in doing this, the greatest care should be taken to make no breach in the mucous membrane, or protargol, at all events, may stain the eyelids or even lead to inflammation of the cellular tissue of the orbit and to loss of the eye, as in cases mentioned by Brewerton[3] and by F. Park Lewis[18] respectively.

The correct preparation of solutions of argyrol and of protargol is a matter of some practical moment. The medicament should be dusted on the surface of the water, which is then allowed to stand without stirring. Heat must never be employed to facilitate the solution, inasmuch as it may lead to the formation of irritating substances. Stock solutions should be sedulously avoided. Steinkühler[4] recommends the use of tablets, each of which contains 0.25 gramme, as a convenient means of preparing fresh solutions of protargol. Burroughs, Wellcome, & Co. prepare both tabloids and soloids of argyrol, the former containing gr. 1/24 and the latter gr. 1 of the compound[5].

In the employment of antiseptic lotions to the eye attention has been directed to the advisability of securing isotonicity and of warming such solutions to the temperature of the human body. Albrand[6] has invented a small instrument by which the antiseptic liquid can be raised to the desired temperature. Cantonnet[23] has pointed out that a 1.4 per cent. saline solution is isotonic with the tears, and possesses one advantage over the boric lotion in common use, namely, that its reaction is not acid, so that it does not interfere with the alkalinity of the lacrymal secretion.

Mercury oxycyanide has been much employed, and as a 1 : 4,000 to 1 : 10,000 solutions has established its claim to be considered an efficient antiseptic, although it possesses a molecular concentration which differs appreciably from that of the tears. There is still considerable confusion

as regards the relation between the different cyanides of mercury—namely, mercuric cyanide, mercury bicyanide, and mercuric oxycyanide[7]. The salt named last, Hg O Hg (CN), is the correct one to employ in eye work. Merck[8] prepares two kinds of mercuric oxycyanide—a pure oxycyanide (Holdermann) and the older form, which contains more or less cyanide. In order to secure uniform results, it is advisable in clinical reports to specify exactly which preparation has been adopted.

Hydrogen peroxide has been recommended by Wolffberg[9] in blepharitis, by Kimpel[10] in ulcus serpens corneæ, by Bronner[11] in gonococcal conjunctivitis, by the reviewer[12] in ophthalmia neonatorum, and, lastly, by Jacqueau[13] in ulcerations of the cornea. One reason that has until recently militated against anything like the general use of hydrogen peroxide has been the unstable nature of the product, as well as the fact that the ordinary commercial varieties are seldom, if ever, free from acid. Merck has overcome these drawbacks by the introduction of 30 % "Perhydrol"—that is to say, an absolutely pure and acid-free hydrogen peroxide, not subject to spontaneous explosion, and capable of being kept almost indefinitely in the original bottles, which are lined with a substance known as ceresite. Perhydrol is a powerful antiseptic and most efficient cleansing agent. The reviewer has seen excellent results from its employment, in conjunction with argyrol 25 per cent., in cases of ophthalmia neonatorum, due to gonococci. It has also, in his hands, proved useful in the treatment of infective ulcerations of the cornea. For these several purposes he has employed the pure, undiluted perhydrol.

A solution which contains sodium aurate has been recommended by Verhoeff[14] as an efficient antiseptic, well adapted for use to the eye. In laboratory trials, a 0·5 per cent. solution was found to be effectual.

Pyoktanin (methylene blue) is spoken of with enthusiasm by Wicherkiewicz[15] in the treatment of many disorders of the eye, as corneal ulcerations, septic wounds, suppuration of the lacrymal sac, and so forth. The remedy, however, has been employed for some years (Weill, Prioux, Pechin, &c.), so that its use by the author offers nothing specially novel, except that in a later communication[16] Wickerkiewicz recommends that dionin be employed along with pyoktanin.

Eperon[17] treats infective ulcers of the cornea by means of zinc sulphate, 20 per cent., applied directly to the diseased spot. In his hands, one application of the zinc has usually sufficed to arrest the infective process. Moreover, the zinc cauterisations may be applied in other kinds of corneal ulceration, such as Mooren's ulcer, neuro-paralytic keratitis, relapsing traumatic keratalgia, and infected wounds of the cornea, whether accidental or surgical.

The latest word in silver substitutes is represented by a product of the Bayer firm, named "Sophol," a formonucleinic compound which contains 22 per cent. of the metal in what is called by chemists the "masked form." It is extremely soluble in water. This non-irritating and efficient product has been used to replace silver nitrate in the prophylactic treatment of babies' eyes at birth. v. Herff[19] had one early infection, believed by the author to have been of ante-partum origin, among 1,050 babies treated with sophol—that is, the extremely low percentage of 0·095. E. Gallatia[20] has also used sophol, which according to him, causes no silver catarrh, as does silver nitrate. It kills gonococci, keeps well, and causes but slight irritation. It is put up in 0·25 gramme tablets, of which one, dissolved in 10c. cm. of cold water, makes a suitable strength for application to the eyes. Schiele[21] praises a 5 per cent. solution of sophol in the treatment of acute trachoma. Bock [22] employs a 5 per cent.—10 per cent. solution in all affections of the conjunctiva accompanied by profuse discharge and due to micro-organisms. The reviewer has used a 5 per cent. solution of sophol (prepared in the cold) under conditions for which one ordinarily employs argyrol—as, for example, the various forms of conjunctivitis, affections of the tear passages, and so forth. In his experience, it has proved itself to be as efficient as it is non-irritating. Indeed, clinically there is a great resemblance between its action and that of argyrol.

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4.—Miscellaneous Remedies.

Potassium iodide.—To Dor[1] we owe what may be an important plan of preventing post-operative infections of the eye, namely, by giving three times a day, for three days before operation, fifteen grains of potassium iodide. In support of his suggestion, Dor quotes the case of a man, 70 years of age, with senile cataract, one of whose eyes had been lost by operation. The patient was affected with perineal fistula, together with inflammation of the bladder and prostate. The iodide was given, and although cataract was removed from the second eye under most unfavourable surroundings, yet the result was all that could be desired. The reviewer has had excellent results from the plan, which he adopted in the case of a patient suffering from zonular cataract in whom every surgical intervention was followed by irido-cyclitis until the iodide was given in the way recommended by Dor.

Potassium iodide has been employed with a view to clearing up the opacities of cataract, incipient or advanced. As yet it would perhaps be premature to say anything very definite about the method (introduced by Badal[2] in 1901), although no harm can be done by glancing at what has been accomplished in this direction.* A Madrid surgeon, Verdereau[3], produced cataract experimentally in rabbits, and then endeavoured to clarify the opaque crystalline lens by the direct injection of a solution of potassium iodide (5 per cent.) into its substance. The opacity was found to diminish, but unfortunately the experiment could not be followed to a conclusion, because severe inflammation came on the eyes treated in this way. In a second series of experiments, Verdereau employed subconjunctival injections of the same solution, and found that a distinct effect was produced. One patient alone had the courage to submit herself to a full course of injections, but the results obtained in that case were remarkable, since sight improved from one-sixth to two-thirds, and the lental opacities disappeared step by step with the improvement in vision. Verdereau demonstrated a definite improvement in several other patients, even although many of them underwent a single injection only. Menacho[4] denied the value of potassium in the treatment of cataract. Bourgeois[5], on the other hand, had successful cases, more especially in young subjects. v. Pflugk,[6] has recently published his experiences. He employed the iodide by subconjunctival injection. The injections were given twice or thrice a

* One point of extreme importance in connection with the treatment of incipient cataract is the spontaneous disappearance of lental opacities. Does incipient cataract ever disappear? Leartus Connor (*Journ. American Med. Association*, July 6th, 1907) addressed such an enquiry to a number of ophthalmic surgeons, and to his question received 55 negative answers, 57 negative answers with comments, and 34 affirmative replies. "Including my own cases," wrote Connor, "51 observers report about 147 cases, in which the opacity of incipient cataract has regained transparency in whole or in part."

week, and each consisted of one-half to one Pravaz syringe of a 1 per cent. solution of potassium iodide. The exact formula was: potassium iodide, 0.1.; sodium chloride, 0 2; distilled water, 10.0. Pain was abrogated by the use of acoine oil (*see* p. 595). His figures are striking. Fifty-five cases of cataract were treated, and much improvement followed in 53 per cent., improvement in 33 per cent., and only 14 per cent. remained without appreciable alteration. In no single instance was any complication noted. v. Pflugk believes that the plan advocated by him is directly curative as regards incipient cataract (subcapsular). The reviewer's personal experience in this matter may be stated in a few words. He has treated by subconjunctival injections several patients who were suffering from choroidal lesions and lenticular opacities. *Pari passu*, with improvement in the choroiditis, he has observed lenticular opacities become smaller and in two instances disappear completely. These experiences encourage him to believe that we may some day be in possession of a remedy that, injected beneath the conjunctiva, will cause the absorption of lenticular opacities. What is at present merely a scientist's dream may one day become a sound, a substantial, and a salutary reality.

The efficacy of potassium iodide in the treatment of internal diseases of the eye has been seriously questioned by more than one observer. Thus, Dor[7] has expressed a definite opinion that iodide is not only useless but actually harmful in tabetic atrophy of the optic nerve. He had treated six patients with potassium iodide until four had become blind. Abadie[8] holds that iodide does more harm than good in cases of choroido-retinitis.

Few drugs are so capable as potassium iodide of inducing such widely-spread disturbances. These manifestations, however, are rare as regards the eye. At the same time Gifford[9] has met with three cases in which the iodide gave rise to phlyctenular conjunctivitis, while in another case, in a man aged about 45 years, a small, deep abscess developed in a corneal cicatrix while the iodide was being given. The reviewer has recently had a curious case of idiosyncracy to potassium iodide under his care in a man, 30 years of age, who was suffering from tertiary syphilis. He was treated with ten grains each of potassium iodide and of the citrate of iron and ammonia three times a day. On November 16th, 1907, the iodide was discontinued owing to the existence of well-marked iodic papules on various parts of the face and body. Symptoms of general iodism were also present. When the reviewer saw the patient for the first time on December 4th, 1907—that is to say, eighteen days after the iodide had been stopped—what appeared to be a typical gumma of the left lower eyelid was present. Thus, the outer half of the lid was red, swollen, and infiltrated, and there

was definite ulceration of the affected parts. Another infiltrated area existed in the skin of the left cheek, one inch or so above the upper lip, while below the lower jaw was a carbuncular-looking mass, discharging pus from several outlets. The condition, in reality, was one of what has been termed "tubercular iodism."* It subsided when iodoform ointment was applied locally and the iodide was replaced by sajodin, one gramme twice a day. It may be explained that sajodin is a substitute for potassium iodide, introduced by the firm of Meister, Lucius, and Brünig. It contains 26 per cent. of iodine.

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2. **Rabbits' bile.**—Neufeld found that pneumococci in bouillon were quickly killed by the addition of rabbits' bile to the culture. Nicolle and Adil Bey have shown that this property is due to the action of the bile salts. Morax[1] has subjected bile to practical test in eye work. He treated three cases of pneumococcal-ulcer of the cornea by the local application of rabbits' bile. All the cases ended in cure, but other methods were also adopted. In a case of pneumococcal-conjunctivitis almost all the pneumococci disappeared from the conjunctival secretion within twenty-four hours after the use of a single drop of rabbits' bile.

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3. **Picric acid.**—The reviewer has had an opportunity of confirming Fortunati's[1] claim, which is to the effect that one of the best ways of treating chemical burns of the cornea or conjunctiva, especially by lime, is by means of picric acid. The reviewer has also obtained good results from the acid in two cases of direct burn of the cornea, one from the flame of a Bunsen lamp and the other from a pair of hot curling tongs. The acid may be applied as a saturated solution or (as Fortunati now recommends) as an ointment combining 20 centigrammes of the acid. Salem[2] has spoken highly of picric acid lotion in the treatment

*As regards iodide rashes, a bullous eruption is the commonest manifestation. In rare cases, however, to quote Dr. Norman Walker (*An Introduction to Dermatology*, 4th Edition, 1908, p. 69): "the lesions produced are at first solid, and later break down in a manner so similar to gumma, that one or two patients have been dosed into their graves by the pushing of the very drug which was the original cause of their trouble."

of superficial affections of the eye—as, for example, blepharitis, acute infective conjunctivitis, phlyctenular conjunctivitis and keratitis, trachoma, and ophthalmia neonatorum. He employs the following liquid : picric acid, 0.10 ; distilled water and glycerine, of each 5 grammes.

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4. **Gomenol.**—Gomenol, a vegetable essence obtained from the Melaleuca viridiflora, has been applied to the eye by Ambialet[1] in a long-standing case of parenchymatous keratitis due to inherited syphilis. No other treatment, local or general, was used. In the course of $5\frac{1}{2}$ months, sight rose from perception of light to one-third.

Reference.

(1) Ambialet.—*Annales d'Oculistique*, Decembre, 1907.

5. **Nizin.**—A zinc salt of sulphanilic acid, "Nizin," has recently been introduced by Messrs. Burroughs, Wellcome, & Co. It occurs as a white crystalline substance, neutral in reaction, and readily soluble in water. The reviewer is pleased with its effect in diplobacillary conjunctivitis and in ulcers of the cornea associated with that affection, when employed as a solution containing one to three grains of the product to one ounce of distilled water. He regards it as a most efficient substitute for the zinc chloride in common use.

6. **Jequiritol.** — This agent, introduced by Römer[1], of Würzburg, represents, as Albert B. Hale[2] has well said, "the application of the modern laboratory idea to botanic as well as to therapeutic science." Jequiritol is a standardised abrin preparation obtained from the seeds of the Abrus precatorius. It is intended to be a scientific and exact substitute for the older jequirity solutions, which, in their turn, replaced the ancient inoculation of an eye with gonorrhœal discharges. Jequiritol is supplied in four different strengths with a curative serum and printed instructions for use by Merck, of Darmstadt. No. 1 concentration is the mildest and No. 4 is the strongest. The former kills a white mouse weighing 20 grm. within four days if one-sixth of a grain be injected subcutaneously. Dropped into the eye in slowly increased amounts and strengths these liquids give rise to intense reaction, marked by redness and swelling of the eyelids, chemosis, enlargement of the neighbouring glands, and so forth. When symptoms appear likely to exceed the desired end, they may be mitigated by using the jequiritol-serum—that is to say, an anti-toxin prepared on the principle of Behring's serum.

Jequiritol is employed mainly for the clearing of corneal opacities, especially such as result from trachoma, eczema of the cornea, and interstitial keratitis. The agent does not appear to

have been at all extensively employed in Great Britain or in America, although from other parts of the world conflicting reports as to its value continue to appear periodically. One school is represented by H. Coppez, who has treated about one hundred cases, and succeeded in healing ulcers, clearing pannus, and rendering the conjunctiva smooth. The other school is represented by de Wecker (the introducer of jequirity into Europe), who dwells upon the dangers and disadvantages of the new agent.

The preparation is expensive, and during its use patients must be confined to bed or, at least, be made to keep the house. The pain and other discomforts caused by jequiritol are serious drawbacks to anything like its general use. These and other considerations have led the reviewer to employ jequiritol in a sparing way and in selected cases alone. He will summarise results in ten of his cases as follows :—the series included seven males and three females, whose ages ranged from six to fifteen years. In three, both eyes were treated, and in seven one eye alone. The corneal opacities had been caused by trachoma in six instances and by eczema in four. Re-action, as a rule, was insignificant until the strongest concentration of jequiritol was applied. Pain, membrane on the conjunctiva, chemosis, vascularity of the cornea, mastoid redness, swelling of the side of the face, enlargement and tenderness of the preauricular and cervical glands, headache, anorexia, and a rise in temperature to 100° F. or 101° F. were constant accompaniments of the cases in which jequiritol set up marked reaction. The complications of the treatment included abscess of the lacrymal sac. In one patient, a girl, aged 8 years, affected with active trachomatous pannus, seven applications of jequiritol led to severe reaction, associated with exfoliation of the anterior layers of the central region of the cornea. It was necessary in this case (the only one in the series) to make two applications of the *Heilserum*. With regard to the effects on sight, there was no change for the better in four cases, and slight improvement in the remaining six. In no instance was the bettering greater than could be accounted for by the mere efflux of time, and it was certainly not so pronounced as could have been obtained under simpler, more economical, and less painful methods of treatment. In the reviewer's hands, therefore, the results obtained from jequiritol, although of some scientific interest, are scarcely such as to justify him in undertaking further experiments, That he is content to leave to other people.

References.

(1) Romer.—v. Graefe's *Archiv f. Ophthalmologie*, 1901, No. 1.
(2) Hale, Albert B.—*Ophthalmic Record*, December, 1903.

(*To be concluded*).

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—INFECTIONS.

(1) **Bylsma.—Septic panophthalmitis.** (Septische panophthalmie.) *Wochenschrift für Therapie und Hygiene des Auges*, 19 April, 1906.

(2) **Paul, L.—Septic retinal changes in typhoid fever.** (Septische retinal-Veränderungen bei Typhus Abdominalis.) *Klin. Monatsbl. f. Augenheilkunde*, Juli-August, 1906.

(3) **Randolph, Robert L.—Bacteriological examinations of the conjunctival sac in typhoid fever and in pneumonia.** *Bulletin of the Johns Hopkins Hospital*, October, 1906.

(4) **Holmes Spicer, W. T.—Metastatic infection of the eye.** *Transactions Ophthalmological Society* U.K., 1906.

(5) **Pascheff, C.—On a case of subconjunctival abscess due to staphylococci.** (Ueber einem Fall von subconjunctivalem Staphylococcus Abscess.) von Graefe's *Archiv f. Ophthalmologie*, Bd. 67, 2, November 19, 1907.

(6) **Igersheimer, I.—Contribution to the pathological anatomy of diphtheria of the conjunctiva.** (Beitrag zur pathologischen Anatomie der Conjunctival-Diphtherie.) von Graefe's *Archiv f. Ophthalmologie*, Bd. 67, 2, November 19, 1907.

(7) **Noll, H.—Diphtheria of the conjunctiva and cornea in an adult.** (Ueber Diphtherie der Bindehaut und Hornhaut bei einer Erwachsenen.) *Archiv f. Augenheilk.*, Dezember, 1907, p. 14.

(8) **Moissonnier.—An atypical case of gonococcal conjunctivitis.** (Un cas atypique de conjonctivite gonococcique.) *Ann. d'Oculistique*, T. CXXXIX, p. 123, février, 1908.

(9) **Kraus, W.—Streptococcal infection of the eye and its surroundings in impetigo streptogenes.** (Streptokokkeninfection des Auges und seiner Adnexa bei Impetigo Streptogenes.) *Zeitschrift für Augenheilkunde*, Februar, 1908.

(1) A young healthy woman who had had an abortion about the third month, with putrid lochia, was found by **Bylsma** (Middelburg) to have embolic septic panophthalmitis. Bylsma enucleated the eye, and the patient survived. The author discusses the *pros* and *cons* of enucleation under such circumstances. The main points were, the risk of death whether the

eye remained or was removed; the fact that the lochia being no longer septic the eye remained the only focus and therefore in itself a danger; the fact that the eye was sightless.

ERNEST THOMSON.

(2) **Paul** examined a case of typhoid fever shortly before death, and found in both retinæ, apart from hæmorrhages, white spots exactly like those described by Roth in cases of septicæmia. Otherwise, the eyes were normal. On microscopical examination of both bulbi, no microbes were seen within or without the retinal vessels, nor were there any signs of inflammatory exudation. The white spots were due to groups of swollen nerve-fibres, and a local œdema of this layer of the retina. This is the first case in which septic retinitis has been observed in typhoid. Considering his microscopical findings, Paul holds that the changes were caused by circulating toxines, and not by microbial emboli. C. MARKUS.

(3) **Randolph**, after examining the conjunctival sacs of 100 cases of typhoid and 48 cases of lobar pneumonia, concludes that the bacterial flora of the conjunctival sac during these diseases show practically no difference from that of healthy individuals. E.T.

(4) **Holmes Spicer** (London) details the histories of a number of most interesting cases which all had this in common, that inflammatory changes in the posterior part of the eyeball were associated with more or less distinct evidence of microbic infection elsewhere and that evidence of syphilis was negative. The following are the titles of the cases:—(1) case of staphylococcus abscess in the retina due to infection from skin abscesses; opthalmoscopic exploration of the retinal tumour with a needle; (2) case of phlebitis of retina due to metastatic infection from a skin abscess; (3) acute retinal phlebitis and local keratitis profunda following an attack of diarrhœa due to ptomaine poisoning; (4) diffuse exudation between retina and choroid producing local detachment of the retina, due to infection from boils in the neck. The cases are of such great interest as to diagnosis, prognosis, and treatment, and are so carefully described, that justice cannot be done to them in an abstract. As C. D. Marshall remarked, in discussing the paper, "they impressed upon one the extreme danger arising from the presence of purulent matter in the body, and especially in the blood-stream." They should be studied in the original by every reader. ERNEST THOMSON.

(5) Subconjunctival abscess is one of the rarest affections of the eye, and **Pascheff's** case is the more interesting as it points to a peculiar ætiology of the process; his patient was suffering from boils in the neck, and he assumes that the infection was conveyed to the subconjunctival tissues by the blood or lymph-circulation. The abscess contained only scanty pus, in which staphylococci were found. The portion affected was near the

insertion of the internal rectus muscle and Tenons fascia must have been partly destroyed, as there was exophthalmos and divergent squint. This is the fifth ætiology of subconjunctival abscess, the four others being :—(1) idiopathic and the penetration of an eyelash under the conjunctiva ; (2) secondary from scleritis ulcerosa ; (3) from Tenonitis ; and (4) metastatic from iridochoroiditis. R. GRUBER.

(6) **Igersheimer** reports anatomical examination of two cases of conjunctival diphtheria. Loeffler's bacilli were certainly present in his first case, and it is interesting to note that they did not pass into the necrotic tissue, while the staphylococci, which were also present, did. R. GRUBER.

(7) **Noll** gives details of a case of diphtheritic conjunctivitis observed in an adult woman. The disease is uncommonly rare in adults. The author touches upon this point, and refers to the experience of Uhthoff, Schirmer, Sydney Stephenson, Burton, Denti, and others, whose cases show that this form of conjunctivitis is confined almost entirely to children below the age of ten. The author's patient was a tall, still fairly strong, woman, *æt.* 61. She complained of loss of appetite, shivering fits, and a feeling of lassitude, which had lasted for about a week. Both lids of the left eye were greatly swollen and hyperæmic, but not hard. The lid-margins were glued together, and, on separating them, a creamy, yellow pus poured out. The whole of the conjunctiva was very hyperæmic and œdematous. Grey membranes were found attached to the conjunctival surfaces of both lids, and to the lower and inner portion of the bulbar conjunctiva. When attempts were made to remove them, the conjunctiva began to bleed. There was a greyish infiltration of the cornea, in which an ulcer developed later on. The specific organism, besides some staphylococci, was found, and proved so virulent that it killed one guinea-pig in 24 and another in 36 hours. In spite of this virulence, the patient had no rise of temperature, and did not suffer from any serious general disturbance of her health. She was treated with the specific serum, and discharged, cured, a fortnight after admission.

PERCIVAL J. HAY.

(8) **Moissonnier's** patient, a boy, aged 14 years, developed a conjunctivitis in his left eye, characterised by œdema of the upper lid, and the presence of a discharge, resembling white of egg, but not purulent. There were elongated ulcers along the upper and lower margins of the cornea, and a number of whitish spots of pseudo-membranous exudation on the conjunctiva covering the tarsus of the upper lid. On microscopic examination, numerous Gram-negative diplococci, mostly intra-cellular, which coloured easily with aniline stains, were found. Unfortunately, culture experiments, to decide whether these were gonococci or meningococci, could not be carried out, but the author is of opinion that considering the relative frequency of

the two organisms, he is justified in assuming that they were gonococci, in spite of the absence of the symptoms usually resulting from infection with that organism. Daily applications of 3 per cent. solution of nitrate of silver for a fortnight having produced no improvement, the conjunctiva was touched with tincture of iodine, with the result that a rapid cure followed. The ulcer in the upper part of the cornea perforated, leaving an anterior synechia. The patient was discharged cured, but six weeks later returned with glaucomatous symptoms which yielded to division of the synechia. R. J. COULTER.

(9) **Kraus** (Marburg) describes a case of a moulder, aged 37 years, who suffered from a pustular eruption of the face and hands. While casting, some hot metal flew into his eye. The resulting inflammation did not clear up, but he developed a corneal ulcer and lacrymal obstruction, with dacryocystitis. The ulcer was treated with atropine and a bandage, and the sac extirpated. The ulcer spread, and was surrounded by an area of infiltration, the conjunctiva became thickened and inflamed in the neighbourhood of the ulcer, and ultimately a small patch necrosed. The ulcer showed a tendency to become a spreading ring ulcer, but healed up after cauterisation.

Streptococci were obtained in pure culture from the skin pustules and from the corneal ulcer and the conjunctival lesion. The skin condition was regarded as *impetigo simplex*, and it was assumed that the patient had infected the burn on his eye with septic fingers. T. HARRISON BUTLER.

II.—OPTIC NEURITIS IN CEREBRAL TUMOURS.

Paton, L.—Optic neuritis in cerebral tumours. *Transactions Ophthalmological Society U.K.*, 1908, Fasc. ii.

Paton's paper (which is accompanied by a tabular analysis) and the discussions upon it occupy thirty-two pages of the *Transactions*, and when it is said that there are fourteen pages of discussion the interest aroused by the paper among ophthalmologists and neurologists will be obvious. It is based on a statistical analysis of 252 cases diagnosed as cerebral tumour at The National Hospital, Queen Square, London, between 1899 and 1905. The fact that the percentages have been worked out from the total number of cases *diagnosed*, instead of from the *confirmed* cases only, was commented upon by J. B. Lawford and Sir Wm. Gowers, and the author promised that when he published his full paper later on he would alter this. The points which are specially brought out are as follows:

(1) **The frequency of occurrence of optic neuritis in tumours of different regions.**—Fourteen cases of temporo-sphenoidal tumour all showed optic neuritis. Average swelling 4.72 D. intense in every case, eight markedly hæmorrhagic, definite macular fan in two. Forty-one cases of cerebellar tumour all showed optic neuritis, average swelling 4.4 D. twelve showed hæmorrhages, five presented macular changes. Of thirteen extra-cerebellar cases two showed no neuritis, the remainder marked neuritis, average swelling 5.03 D. seven showed hæmorrhages, and one a macular fan. Of 32 cases of frontal tumour four showed no neuritis, average swelling 4.27 D. twelve were hæmorrhagic, in one case a macular fan. Of 28 cases of parietal tumour four had no neuritis, average swelling 3.56 D. hæmorrhages in six cases, well-marked macular fan in one case. Of 29 sub-cortical tumours 11 had no optic neuritis, average swelling 4.2 D. seldom hæmorrhagic, macular changes in one case. In four out of sixteen tumours of the optic thalamus and mid-brain optic neuritis was absent, average height of swelling 4.1 D. five hæmorrhagic cases, macular figure in one case. In ten out of twenty-three pontine tumours there was no optic neuritis, where it occurred it was very intense, average height of swelling 5.25 D. mostly hæmorrhagic, two showed macular figures. Further investigation of the (1) sub-cortical and (2) pontine cases, showed that the development of neuritis corresponded to invasion of the cortex and lateral ventricles in (1) and to invasion of the cerebellum in (2). From the above facts Paton concludes that "optic neuritis is most frequent in tumours of the cerebellum and cerebral cortex. It is least frequent in tumours of the sub-cortical white matter and pons."

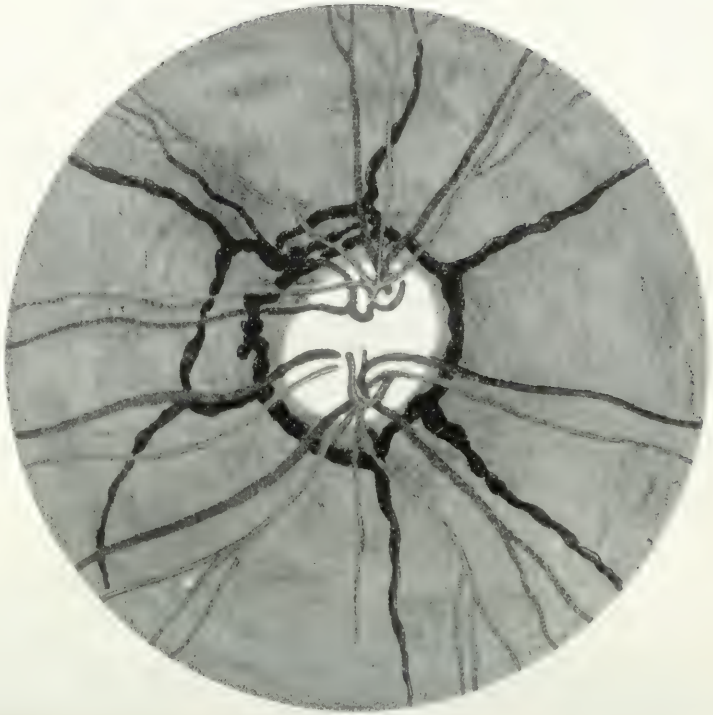
(2) "**The intensity of the optic neuritis in tumours of the cerebral cortex varies inversely with the distance of the part affected from the anterior pole of the middle fossa.**" (3) **The nature of the growth** appears to have no bearing on the occurrence of optic neuritis except in so far as the nature of the tumour determines its position. (4) Regarding the **relationship of the intensity of neuritis to side of brain affected**, the author's opinion is challenged by Sir Victor Horsley, Sir William Gowers, and C. E. Beevor. That opinion is as follows:—"When we examine the figures in detail we see that the slight preponderance in the figures for the homolateral eye as against the contralateral is mainly due to temporo-sphenoidal and parietal tumours. Taking those away the preponderance is rather the other way. It is in frontal and cerebellar cases particularly that this difference in the intensity of the neuritis has been most relied upon as indicating the side to choose for operation. But, as the figures show, little reliance can be placed on this as a diagnostic point. It has been thought that if the first development of the neuritis could be seen the eye first showing

it would indicate the side of the tumour. Luckily this observation has been made in thirty-six cases, and again it proves of no great value . . . . . Unless then, the investigation of a much larger number of cases produces a very marked alteration in the relative proportions of these statistics, we must conclude that neither the commencement of neuritis nor the height of swelling can be relied upon to indicate the side of the tumour." (5). As to **changes in the macular region** described by R. M. Gunn in his paper before the Edinburgh Congress, the author holds that the phenomena as observed in albuminuric retinitis and in optic neuritis of cerebral tumour are essentially different. He regards the macular fans in albuminuric retinitis as due to active œdema, and in optic neuritis of cerebral tumour as due to passive œdema, a local manifestation in the retina of a general condition of the cerebral tissues. This opinion was criticised in the discussion by Gunn. The author does not think that we can say definitely, as has been stated, that a macular fan is found more frequently in cerebellar tumours than in any other type of tumour. (6). As to the **nature of the process "generally known as optic neuritis as it occurs in cerebral tumours."** The author reaches five *negative* conclusions, beyond which he will not go in a *positive* direction, which negative conclusions have led Sir William Gowers to remark: "The paper suggests a very interesting conclusion (which is clearly not intended by Mr. Paton) regarding the mechanism of optic neuritis in tumour. The conclusion is that it can have no mechanism." These five negative conclusions are as follows:— (a) Optic neuritis is not an inflammation descending by the meninges. This is proved by post-mortem records. (b) It is not an inflammation descending by the nerve trunk. Clinical evidence is against it. Many of the cases pass through all the stages of papillitis to complete subsidence with only the slightest interference with visual acuity. (c). It is not caused by pressure in the nerve sheath. The dilatation of the vaginal space is a late manifestation in the process, and is mostly absent in cases where death occurs in the early stages of neuritis. The dilatation of the vaginal space is probably exactly comparable to that of the ventricles. (d). Clinical evidence is not in favour of the œdema being due to toxines. (e). There does not seem to be any evidence in these cases in favour of any vaso-motor theory. (f). The occurrence of the symptom of temporary amblyopia (attacks of temporary dimness of vision frequently occurring, mostly associated with giddiness and increased headache) is not due to the optic neuritis. It may occur in cases in which there is no optic neuritis; it is an early symptom and may be present before any manifest changes in the disc.

As has been stated, the paper led to a long discussion, which was taken part in by the President (R. M. Gunn), Lawford,

R.E.

L.E.



Parsons, Sir Victor Horsley, Sir W. R. Gowers, Beevor, F. Buzzard. Paton replied. The discussion centred in the main round the diagnostic point of homolaterality, Paton's contention, which he maintained was true on the basis of his statistics, being opposed by Sir Victor Horsley and Sir Wm. Gowers. One looks forward with interest to the fuller paper which is promised by Paton. ERNEST THOMSON.

III.—A CURIOUS VASCULAR ANOMALY OF THE OPTIC DISC.

Coppez, H.—An abnormal vascular ring around the optic disc. (Un anneau vasculaire peripapillaire anormal.) *Bull. de la Société belge d'Ophthalmologie*, No. XXIV, 1908, p. 30, and *Archives d'Ophtalmologie*, juillet, 1908.

A female patient, aged 39 years, consulted **Coppez** (Brussels) on account of *mouches volantes*. Emmetropia. V.=5/5. The optic disc, and the central vessels of the retina were normal. The details of the choroid were masked by the pigmented epithelium. But surrounding each optic disc was a curious vascular ring. The ring lay behind the central vessels of the retina, but in front of the pigmented epithelium in the middle or external layers of the retina, which are usually not vascularised. It was made up of ribbon-like vessels, without light-streak, and of a dull-red hue. The diameter of the vessels was variable, and their course sinuous. The vascular ring, which was single, double, or triple according to the different parts, encircled the optic disc more or less regularly. Towards the periphery it gave off six branches in each eye, and the four largest branches followed the direction of the four chief branches of the central retinal vessels. No anastomosis existed between the abnormal vascular ring, on the one hand, and the central retinal vessels, on the other. The abnormal vessels did not pulsate. Neither pressure upon the eyeball, nor compression of the jugulars, caused any modification in their diameter.

Coppez's curious case is analogous to one described by Schrader in 1906 (*Zeitschrift für Augenheilkunde*, Bd. XVI, *Ergänzungsheft*, p. 81), and considered by him to be an example of ectopia of the arterial circle of Zinn. Coppez explains his own case on the hypothesis of a supplemental venous circle. Some of the choroidal blood is carried not by the venæ vorticosæ but by this new route, and leaves the eye by the posterior pole. These vessels recall the optico-ciliary veins of Elschnig.

SYDNEY STEPHENSON.

IV.—EPILEPSY AND EYE-STRAIN.

(1) **Rodiet, Pansier, and Caus.—The treatment of concomitant ocular lesions in the therapeusis of epilepsy.** (Le traitement des lésions concomitantes de l'appareil oculaire dans la thérapeutique de l'epilepsie.) *Recueil d'ophtalmologie*, novembre, 1907.

(2) **Hodskins, M. B., and Moore, G. A.—Relation of strain to epilepsy.** *Vermont Medical Monthly*, March, 1908.

(1) Can an ocular lesion set up epilepsy or influence the frequency of the attacks? Srokolski has recorded a case of a man in whom epilepsy was induced by a wound of the cornea with consequent irido-choroiditis. Stevens published an analogous case due to influenzal iridocyclitis. Stevens, Hern, Chavaz, Work Dodd, and Spaking have attributed epilepsy to ametropia, and Beard, Paterson, and Murphy, to heterophoria or heterotropia. Gould and Bielschowsky, however, did not find heterophoria common among epileptics, whilst Martin did not find that astigmatism was any more frequent in epileptics than in healthy individuals. The correction of ametropia does not give encouraging results, *e.g.*, 11 cases improvement, 11 no change, 33 aggravation of symptoms. The authors' cases were of long-standing, and no attempt to correct ametropia was made, owing to their excitable and demented state.

J. JAMESON EVANS.

(2) **Hodskins** and **Moore**, while admitting that eye strain may be an excitant in an individual of sufficiently unstable nervous system, believe the *rôle* played by ocular defects in the causation of epilepsy to be a very slight one. C. A. OLIVER.

V.—PULSATION IN A VENA VORTICOSA.

Sachs.—Spontaneous pulsation of an abnormal vena vorticosa, lying near the macula. (Spontane pulsation einer atypischen, nahe der Makula gelegenen Wirbelvene.) *Zeitschr. f. Augenheilk.*, Juni, 1906.

Sachs recounts the case of a woman, 70 years of age, who had since childhood high myopia and bad vision, and later had both eyes operated on for cataract. The retinal vessels were normal. The choroid showed high-grade changes, and in the right eye a large patch of choroidal atrophy surrounded the disc and reached the macula. On the outer side of the macula, a few

moderate-sized veins were seen, which united into a single trunk, perforating the sclera just below and to the outer side of the patch of choroidal atrophy. It was, therefore, an abnormal vena vorticosa. Further, this vein was seen to pulsate, and in a paradoxical manner, for with every systole of the heart the vein became smaller. Light pressure on the globe caused the vein to collapse. The other vessels did not pulsate. Sachs discusses various explanations of this curious pulsation, and comes to the conclusion that the posterior staphyloma has so widened the exit aperture of this vein that the raised intra-ocular tension at each systole drives the blood easily forward into the area of lower pressure. A. LEVY.

VI.—PAPILLITIS AFTER INJURY OR DISEASE OF THE ANTERIOR PART OF THE EYE.

(1) **Knapp, Arnold.—Optic neuritis after injury or disease of the anterior half of the eyeball.** *Trans. Amer. Ophthalmological Society*, Vol. XI, Part I, p. 215.

(2) **van den Borg, T.—Papillitis following diseases of the anterior parts of the eye. (Die Papillitis im Anschluss an Erkrankungen des vorderen Teils des Auges.)** *Klin. Monatsbl. f. Augenheilkunde*, April, 1908.

(3) **Happe, H.—On papillitis following slight perforating injuries of the anterior parts of the eye. (Zur Kenntnis der Papillitis im Anschluss an leichte perforierende Verletzungen des vorderen Teils des Auges.)** *Klin. Monatsbl. f. Augenheilkunde*, April, 1908.

(1) That optic papillitis may occur after injuries to the anterior segment of the eyeball is an observation that we owe to Hirschberg, who described the condition many years ago in the article on "Ophthalmoscopy" in Eulenberg's *Encyclopædia*, second edition. **Arnold Knapp** (New York) describes two cases of the kind in children, where papillitis was found in association with a penetrating injury of the eyeball. One of the cases ended in recovery; the other was seen on a single occasion only. On looking over the collection of eyes that have been removed on account of traumatic cyclitis at the New York Ophthalmic and Aural Institute, Knapp was astonished to find how frequently the optic nerves were swollen. Moreover, in his experience it is not uncommon to find optic neuritis after removal of cataract in eyes that although doing well remain somewhat congested, the result presumably of moderate cyclitis. These changes eventually disappear. This so-called "traumatic" optic

neuritis, it appears, may follow a trivial injury, is in no way related to sympathetic disease, and offers a good prognosis. It is important to note that it may succeed irido-cyclitis of non-traumatic origin, of which Knapp in the present communication gives two examples. In the first case, one of tuberculous irido-cyclitis, the neuritis was observed with the ophthalmoscope, and in the second, also an instance of tuberculous disease, it was found after the eyeball had been enucleated. Elschnig (*Wiener klin. Rundschau*, 1901, Nos. 3) has pointed out that the sole difference between neuritis of the type described in Knapp's paper and that of brain tumour lies in the absence from the former of the convex forward displacement of the scleral lamina which is found in the latter condition. SYDNEY STEPHENSON.

(2) **van den Borg** in an interesting paper deals with a long series of cases in which affections of the anterior parts of the eye, such as perforating wounds and tubercle of the iris, gave rise to papillitis, similar in many ways to the choked disc of cerebral origin. This form of papillitis is distinguished clinically by the slight impairment of vision it causes, as well as by its good prognosis, since it disappears, provided the primary inflammation subsides. Enucleation had to be performed in several instances on account of pain or threatening sympathetic ophthalmitis, and thus material was gained for histological examination. It was found that the swelling of the disc in such cases is due essentially to œdema of the tissue, as is also the case in the cerebral form of papillitis. But it differs from the latter in two respects: 1. the lamina cribrosa is not pushed forwards but keeps its level; and 2. there is an infiltration of the central cup and the sheaths of the central vessels with leucocytes. The ocular form of papillitis is accounted for by the assumption of toxins reaching the optic nerve by the posterior lymph route. C. MARKUS.

(3) The paper of **Happe** forms a supplement to van den Borg's more extensive communication on the same subject. Pronounced papillitis was observed with the ophthalmoscope in two cases of perforating sclero-corneal wounds accompanied by prolapse of the iris. The optic nerves were implicated, although the inflammation caused by the injury and the following excision of the iris was only moderate, and the media remained perfectly clear. It was also remarkable that the swelling of the disc in these cases outlasted the signs of irritation in the anterior parts of the eye. C. MARKUS.

VII.—SYPHILIS AND MYOPIA.

Antonelli, A.—Syphilis and myopia. (**Syphilis et myopie.**) *Archives d'Ophtalmologie*, juin, 1908.

The view that a relationship exists between congenital syphilis, on the one hand, and myopia, on the other, is one that

we owe to Antonelli (*Thèse de Paris*, 1897). Cruchaudeau first clearly described and affirmed the relationship between myopia and the acquired disorder (*Thèse de Paris*, 1901).

In the present communication **Antonelli** (Paris) discusses the connection between the two conditions when examined in the light afforded by recent publications. In congenital syphilis, as he points out, the connection with myopia is more intimate, more frequent, and more evident than in the acquired disease. In the latter, one has to deal rather with aggravations or complications brought about by specific infection in eyes already more or less myopic.

Congenital syphilis.—There are three possibilities to be considered: 1. The eyes may be myopic from the first few years of extra-uterine life. The myopia is sometimes monocular, or, at least, of higher amount in one eye than in the other. It is associated with congenital ophthalmoscopic lesions, usually binocular, although unequally distributed as regards the two eyes. The case is mentioned of a child, clearly the subject of heredo-syphilis, who presented myopia (6 D.) of one eye, complicated with amblyopia (V.—0·2), due to a subatrophic state of the optic disc, presumably from intra-uterine optic neuritis. The sight of the other eye was normal, and the refraction hypermetropic, but there were simple dystrophic pigmentary changes in the choroid and retina. Antonelli considers that monocular myopia which exceeds 2 D. or 3 D., or marked myopic anisometropia, if met with in a young or very young subject, is pathological, and altogether distinct from axial myopia. It is connected with lesions of the central region of the fundus or of the entire choroid and retina, which, in their turn, represent the results of an intra-uterine inflammation or of one supervening very early in extra-uterine life, caused in almost every instance by congenital syphilis.

2. Despite the existence of ophthalmoscopic stigmata, which may remain rudimentary, the eyes become myopic for the first time during the school life. In such cases the myopia probably results from the child's attempts to compensate the lack of defined retinal images, due to uncompensated astigmatism or to fundus lesions, by approximating his work to his eyes. Besides, the eyes of children who suffer from hereditary syphilis are probably more likely than those of healthier subjects to yield to the effects of accommodation and convergence. This "hereditary syphilitic myopia," as Antonelli does not hesitate to term it, is usually equal or almost equal in the two eyes, and seldom exceeds 4 D. to 6 D. The classical posterior staphyloma is often replaced by small areas of cicatricial choroido-retinitis around or near the disc. There is diffuse rarefaction of the chorio-capillaris, the papilla is often framed by pigment, and the disc and vessels may show various alterations.

3. Myopia may be acquired as a complication of a later

manifestation of congenital lesions of the eye. In this connection one recalls the frequent association between myopia and corneal or lental opacities, iritis, and uveitis. In de Lapersonne's case (*Presse Médicale*, 27 décembre, 1905) an interstitial keratitis, due to inherited syphilis, which had cleared perfectly, was followed by myopia, known not to have existed before the corneal manifestation.

Acquired syphilis.—Antonelli quotes cases by Cruchaudeau and by Sulzer respectively which go to prove the connection between acquired syphilis and myopia. Instances of complications are given. The author mentions two particularly interesting cases of detachment of the retina—one in a young myope of about 6 D., which came on during secondary syphilis, and the other in a general paralytic, moderately myopic, before the final demented and cachectic phase. It is easier, Antonelli insists, to prevent these complications than to cure them by energetic and long-continued specific treatment.

SYDNEY STEPHENSON.

VIII.—THE OPHTHALMO-REACTION.

(1) **Painblan.—The ophthalmo-reaction and affections of the eye.** *L'Ophtalmologie Provinciale*, janvier, 1908.

(2) **Butler, T. Harrison.—Calmette's ophthalmo-reaction.** *British Medical Journal*, April 18th, 1908.

(3) **Erlanger, M.—On the conjunctival tuberculin reaction. (Ueber konjunktivale Tuberkulinreaktion.)** *Zeitschrift für Augenheilkunde*, Mai, 1908.

(1) **Painblan** has observed 34 patients suffering from ocular lesions, who were tested with Calmette's ophthalmo-reaction. In 16 of these the eye disease was slight, and the test was applied for general conditions supposed to be of a tuberculous nature, while the remaining 12, so far as could be ascertained, were healthy, apart from the condition of their eyes. In all the cases in which the reaction occurred it passed off without making the disease in the eyes any worse, and the author considers it is not necessary, as was at first advised, to avoid trying the ophthalmo-reaction in patients suffering from lesions of the eyelids or the external membranes of the eye. R. J. COULTER.

(2) Calmette's claim that tuberculous subjects react when tuberculin is placed in the conjunctival sac is believed by **T. Harrison Butler** (Coventry) "to be approximately correct." He inquires whether Calmette's reaction is such a simple practical test that it can be employed as a routine diagnostic method by the general practitioner.

His personal experience of the plan has been very favourable. Negative results may be due to the use of an inactive serum, or to its having been washed out of the eye by the tears. In suspicious cases, where the first trial has yielded negative results, the experiment should be repeated with a more concentrated solution. The final verdict as to the trustworthiness of the Calmette reaction must come from the physician, since the ophthalmic surgeon has seldom the requisite command of tuberculous material. Butler now uses the test as a routine procedure in all doubtful cases of choroiditis or iritis, although he regards it "merely as a help in diagnosis, not as an infallible guide." In his opinion it is not nearly so accurate as the injection of tuberculin. SYDNEY STEPHENSON.

(3) **Erlanger** (Jerusalem) has carried out in Berlin a series of tests with very dilute solutions of tuberculin, in place of the 1 per cent. or 0 5 per cent. solutions generally employed to elicit Calmette's reaction. It is now fully recognised that such powerful solutions are apt to cause dangerous inflammations, more especially in an eye which is already diseased. Following the advice of Wolff-Eisner, the real originator of the reaction, Erlanger used solutions of 1 to 10,000 of old tuberculin (P.G.) for all cases in which either tubercule was suspected or where one or both eyes were diseased. Scrofulous children and those with phlyctenulæ were, without exception, treated with this weak solution. If no reaction were obtained the author then used the ordinary 1 per cent. solution. As a result he never saw any bad effects from the action of tuberculin in the eye. Many cases gave a definite reaction to the dilute solution, but doubtless a larger proportion would have reacted to a stronger. The author offers no opinion as to the value of the reaction as a means of diagnosis of tuberculosis; this question must, he thinks, be settled by the physicians. His research was designed to decide whether the reaction was justified when the eyes were diseased, and he decides that, *with a very weak solution*, there is no danger.

T. HARRISON BUTLER.

IX.—CONJUGATE DEVIATIONS OF THE EYES AND CEREBRAL LESIONS.

Weisenburg, T. H.—Conjugate deviation of the eyes and head, and disorders of the associated ocular movements in tumours and other lesions of the cerebrum. *Journal American Medical Association*, March 23, 1907.

As the result of a personal study of sixteen cases of conjugate deviation of the eyes and head, fifteen of which went to necropsy,

together with the aid of cases in literature, **Weisenburg** (Philadelphia) has attempted to come to such conclusions as to the causes of conjugate deviation of the eyes and head as the evidence in his cases will permit. He says:—

1. Conjugate deviation of the eyes and of the head is dependent on a most complex mechanism. 2. In the human being there is but one oculomotor centre, or, at least, one active functionating centre, situated in the posterior portion of the second and third frontal convolutions, adjacent to the precentral convolutions. 3. A separate centre exists for the movements of the head, probably in the lower anterior portion of the precentral convolution. 4. There is probably in man a distinct centre for the combined movements of the eyes and head, situated in the area between the head and the eye centres. 5. It is probable that the cortical oculomotor, head and combined head and eye centres are subdivided for lateral as well as for upward and downward movements. 6. The oculomotor and the motor head centres are in connection by means of association fibres with the cortical centres for the special senses, in the temporal, occipital, uncinate and other lobes. 7. Any lesion in the motor centres for the eyes and head, or in the related special sense centres, or in the association fibres connecting the former with the latter, will cause an impairment in voluntary deviation of the eyes or of the head, or of both, this depending on the nature and location of the lesion. 8. Lesions in the angular gyrus cause conjugate deviation because of involvement of visual and auditory fibres which lie underneath this area. 9. The theory of Bard, that conjugate deviation of the eyes and head is always accompanied by homonymous lateral hemianopsia, and dependent on this is an error, for in the majority of instances hemianopsia does not exist. 10. Hemianopsia may be caused by the shock or transient effects of the haemorrhage, this loss of half vision being only a temporary symptom and similar in nature to the temporary hemianesthesias sometimes observed in capsular lesions. 11. The occurrence of conjugate deviation of the eyes or of the head, or of both, is of no value as a focalizing symptom, because it may be the result of a lesion in any portion of the cerebrum. It may be of value, however, in conjunction with other localising symptoms. 12. Conjugate deviation of the eyes and head probably occurs in every case of large apoplectic lesions, but in some instances it is a partial or minor form and of transient duration. 13. Paralysis or impairment of associated ocular movement may occur as a result of a hemianopsia. This, however, is only temporary. 14. There is at present no evidence of a centre or centres for automatic ocular movements, but if such centres exist in the thalamus a lesion of these should cause forced or incoördinate ocular movements. 15. Convergence and divergence are probably not reflex acts, but associated ocular movements similar to lateral and upward movements. They probably have

cortical centres in the posterior portion of the second and third frontal convolutions. The movements of convergence and divergence are probably brought about by associating tracts in the pons and cerebral peduncles. C. A. OLIVER.

X.—NYSTAGMUS.

(1) **Nuel, J. P.**—Sight in nystagmus. (De la vision du nystagmique. *Bull. de la Société Belge d'Ophtalmologie* No. 24, 1908.

(2) **Pohl.**—Some thoughts on miners' nystagmus. (Quelques considérations sur le nystagmus des mineurs.) *Ibidem.*

(3) **Dransart and Famechon, F.**—On miners' nystagmus from a medico-legal standpoint. (Du nystagmus professionnel des mineurs au point de vue médico-légal.) *Ibidem.*

(1) **Nuel** (Liége) deals with certain special points relating to miners' nystagmus. 1.—*Oscillation of the objects seen.*—The miner sees objects oscillate when his eyes oscillate, but it is not the same in congenital nystagmus. Nuel has found that these oscillations trouble the patient less and less the longer the nystagmus has lasted. For example, in a man who had suffered from nystagmus for 40 years, they were no longer perceived. 2.—*Acuity of vision.*—The visual acuity is usually normal when the eyes are steady, although it falls to 1/6, 1/12, or lower during the oscillations. 3.—*Position.*—In some miners nystagmus appears when they stoop or lie down, or even if they look downward. We have there a phenomenon of association. 4.—*Hemeralopia.*—Those with nystagmus are more or less hemeralopic, owing to alteration in the function of the rods and cones. This forms one cause of accidents at work. 5.—*Ætiology.*—The cause of the nystagmus is the work done in coal-mines. 6. *Pathogeny.*—The pathogeny is most complex. Two factors especially come into play: first, the darkness of the mine; and secondly, the abnormal direction of the gaze. In crepuscular blindness one employs the rods alone; the miner is able to fix with the perimacular zone, where the rods act best, whence the muscular disturbance.

(2) **Pohl** (Jemappes) has seen in the course of two years 86 cases of nystagmus (Borinage). By looking systematically for the condition among all the miners, he discovered about one in five affected. Tobacco amblyopia does not constitute a special cause of nystagmus. There were only five such cases among the 86 with nystagmus, and, on the other hand, Pohl found six cases of toxic amblyopia without nystagmus.

(3) **Dransart** (Somain) and **Famechon** (Somain) insist especially upon two symptoms: 1. The blepharospasm, which complicated grave cases of nystagmus; and 2. Nystagmic amblyopia. 1. The blepharospasm takes the clonic form, and consists in fibrillary contractions of the orbicularis and in cramp of the levator. The spasms of the lids is synchronous with the oscillations of the eyeball, and, like the latter, they become worse when looking up and disappear when looking down. They are rendered worse by several factors, such as fatigue, movements, light, and occlusion of the eyelids. They are accompanied in most cases by a certain degree of blepharoptosis. 2. In grave cases of nystagmus there exists, if not a true amblyopia, at least accommodative asthenopia and a marked reduction of vision as regards distant objects. The visual field shows no change, but then the examination with the perimeter is rendered very difficult by reason of the oscillations of the eyeball and the spasms of the eyelids. Dyschromatopsia is absent. Although the existence of hemeralopia is probable, yet it is not altogether certain. H. COPPEZ.

XI.—SPRING CATARRH.

1) **Pascheff, G.—On Spring Catarrh.** (Nouvelles communications sur le catarrhe printanier.) *Archives d'Ophtalmologie*, février, 1908.

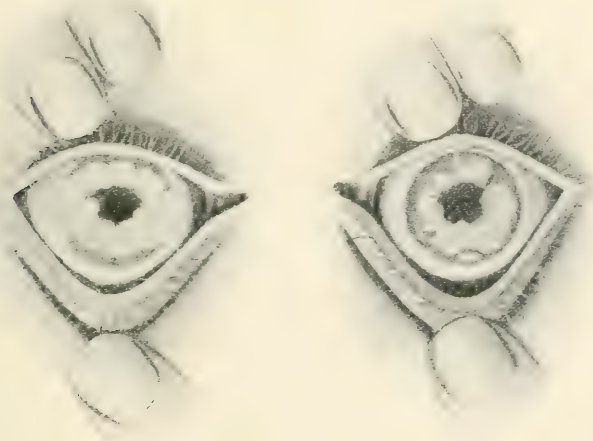
2) **Lagrange, Félix.—A contribution to the study of Spring Catarrh.** (Contribution à l'étude du catarrhe printanier.) *Archives d'Ophtalmologie*, juin, 1908.

(1) **Pascheff** (Sofia) discusses 1. the migration of "mast-cells," and 2, the bacteriology of Spring Catarrh. 1. Ehrlich's mast-cells represent, according to the author, mobile lymphocytes, which multiply *in situ* and which proceed from the blood most probably from the vascular walls. Their migration is not peculiar to Spring Catarrh, although much more marked in that affection than in any other disease of the conjunctiva, where it may occur, as trachoma. 2. Pascheff has investigated bacteriologically eleven cases of Spring Catarrh in process of full evolution. Results were:—a clubbed bacillus in five; staphylococci and streptococci in two; and a negative result in four. The clubbed bacillus was Gram-positive, grew well on ordinary media, including gelatine, stained well with Neisser, and presented points of resemblance to Loeffler's organism. Pascheff gives several points of distinction between it and the xerosis bacillus, such as the possession of a capsule,

the production of acid, and its pathogenicity as regards the vitreous body of a rabbit. Its colonies form, according to Pascheff, tiny white points (visible to the naked eye) both upon the pericorneal thickening and also upon the upper tarsal conjunctiva. SYDNEY STEPHENSON.

(2) **Lagrange** (Bordeaux) describes an exceptional case of Spring Catarrh, of which the main facts follow :—

A child of 5 years, in good general health, although there was some enlargement of the parotid and submaxillary glands, presented the curious condition shown in the accompanying figures, from which it will be seen that the limbal manifestations of Spring Catarrh had seriously encroached upon the cornea, so as to leave merely the central region free from growth. V. = about one-third. The palpebral conjunctiva was also affected, although not to a marked extent The pituitary membrane was congested, and as regards the right nostril was covered with secretion. Examination of the blood showed a slight increase of the leucocytes (9,300 per c.cm.), together with a slight reduction in the percentage of the lymphocytes, and an increase of the eosinophiles, and the presence of abnormal elements, the so-called "transition" and "irritation" forms. There was a family history of tuberculosis and a personal one of bronchitis. One eye had first been noticed to be affected during the child's *recovery* from the latter ailment.



Several vegetations removed from the conjunctiva were inoculated into the inguinal region of a guinea-pig without result, either local or general. The secretion, collected with a pipette from the conjunctival sac, contained a disproportionately large number of eosinophil cells, which were, in fact, four times as numerous as the mast-cells.

Pathological Anatomy.

1. *Palpebral Conjunctiva and Tarsus.*—The conjunctival prominences consisted of a dense fibrillary network infiltrated with young cellular elements. The epithelium was nowhere thickened.

In other words, the anatomical situations of the lesions was subepithelial. The fibrillæ were more abundant in the deeper parts of the specimens, and were derived directly from the tarsal plate. They represented, in fact, a proliferating tarsitis. The cellular elements included embryonic cells, mast-cells, and many eosinophils. The first (embryonic cells) were disseminated almost impartially in all parts of the conjunctival granulations; the second (mast-cells) were more numerous in the deeper parts; and the third (eosinophils) were especially abundant in the superficial parts. The tarsal plate, of which a bit was excised for examination, was in a state of proliferation, and included glandular elements of normal appearance. (2) *Ocular Conjunctiva*—The chief change in the ocular conjunctiva lay in the pronounced degeneration of the investing epithelium. The underlying tissue contained mast-cells, fibroblasts, and a few eosinophils. (3) *Cornea.*—The stratified epithelium showed no changes, thereby once again proving that the lesions of Spring Catarrh are not epithelial lesions. The tissue proper of the cornea, which contained large numbers of eosinophils, contributed to the morbid formation so evident on clinical examination.

SYDNEY STEPHENSON.

XII.—ARTERIO SCLEROSIS.

(1) de Schweinitz, G. E.—Concerning the signs in the retina of persistent high arterial tension and their diagnostic and prognostic import. *Trans. American Ophthalmological Society*, Vol. XI, Part 1.

(2) Macleish, Archibald J.—The contribution of ophthalmology to the diagnosis of arterio-sclerosis. *Southern California Practitioner*, January, 1907.

(3) Marple, Wilbur B.—The ocular lesions of general arterio-sclerosis. *New York Medical Record*, March 10th, 1907.

(4) Reber, Wendell.—The value of the ophthalmoscope in the early diagnosis of arterio-sclerosis. *Monthly Cyclopædia of Practical Medicine*, Vol. X, p. 149, 1907.

(5) Cheatham, William.—Some of the effects of high arterial tension upon some of the tissues of the eye. *American Practitioner and News*, June, 1907.

(1) An important article by de Schweinitz (Philadelphia) on the retinal signs of high arterial tension appears in the XI volume of the *Transactions* of the American Ophthalmological Society.

It deserves to be widely studied. de Schweinitz divides the retinal signs of high arterial tension into such as are suggestive, and such as are pathognomonic. The former include uneven calibre and undue tortuosity of the retinal arteries, increased distinctness of the central light streak, an unusually light colour of the breadth of the artery, and, lastly, alterations in the course and calibre of the veins. The pathognomonic signs include beading of the retinal arteries, loss of translucency, white lines alongside the vessels, alternate constrictions and dilatations of the veins, and particularly (as originally pointed out by Marcus Gunn, of London) indentation of the veins by the stiffened arteries when the last-named cross the veins on the fundus oculi. Finally, one may see œdema of the retina as a grey opacity around the optic disc, or following the course of the vessels, and linear, roundish, or guttate hæmorrhages. The changes of arterio-sclerosis, as Gunn has well said, are not brought about by old age alone. Visible changes, however, usually begin between forty and fifty years of age. But they may, in point of fact, arise at any age. de Schweinitz met with one of his most marked examples in a man, aged 37 years. According to de Schweinitz, three signs occur very early in these cases : 1.—a corkscrew-like appearance of certain arterial twigs ; 2.—a flattening of a vein where it lies in contact with an artery ; and 3.—a congested appearance of the optic disc. As regards the significance of the signs, it is undoubted that the retinal vascular changes have much more than a merely local meaning. They furnish one of the most important indications of the existence of arterio-sclerosis, shown otherwise by the condition of the pulse, the character of the cardiac sounds, the tracings of the sphygmogram, and the readings of the sphygmanometer. The ophthalmoscopic signs may often lead to an early diagnosis of arterio-sclerosis. They are, in fact, one of the most important indications of a general arterio-sclerosis. Now the signs mentioned above—that is to say, the condition of the pulse, of the cardiac sounds, and so forth—are found not alone in arterio-sclerosis but also in many other conditions of the system, organic and nervous in origin, which elevate pressure nearly constantly and in which arterio-sclerosis has no part, except perhaps a consequential one. The ophthalmoscopic signs, however, are produced only by the persisting high arterial pressure of arterio-sclerosis. Their diagnostic importance, therefore, is self-evident. We may re-echo Marcus Gunn's words :—"ophthalmoscopic examination is one of the most ready clinical means for the early detection of important arterial changes," and de Schweinitz maintains that if the findings are positive, they are diagnostic of the condition.

Prognosis quoad Visum.—Hæmorrhages, the result of arterio-sclerosis, may obviously give rise to much or to little disturbance of sight, according to their size and position. They may invade the vitreous, result in proliferating retinitis, cause glaucoma, or

detach the retina. Cases in point are included by de Schweinitz in the contribution under review. The arterial changes may further have an influence in the production of retro-bulbar neuritis and of lenticular opacities (Marcus Gunn). de Schweinitz traces a form of obstinate asthenopia in middle-aged women, after presbyopia has been established, to neurasthenia as the outcome of arterio-sclerosis. This type of asthenopia may be benefited if the high arterial tension be brought down to normal by suitable diet and especially by the administration of nitro-glycerin.

Prognosis quoad Vitam.—It is known that a number of patients who show signs of retinal arterio-sclerosis later succumb to cerebral apoplexy. This point has been insisted on by Marcus Gunn. The retinal changes may be associated with renal sclerosis, and, indeed, they may be evident in cases where renal retinitis fails to develop, since they are significant of a process that may end in death before the establishment of a fully developed nephritis. de Schweinitz believes that the ophthalmic surgeon, when he discovers early arterio-sclerosis, should recommend the patient to allow himself to be thoroughly overhauled by a physician. Two cases are mentioned, in the first of which a patient was seized with cerebral apoplexy within two weeks of the discovery of the retinal vascular changes, while in the second, retinal hæmorrhages were observed a couple of months after the finding of early arterial sclerosis. It may be noted, finally, that de Schweinitz lays considerable stress upon the necessity of accurate instrumental measurement of arterial tension, a purpose for which he recommends the Stanton sphygmanometer, a modification of the Riva-Rocci instrument.

SYDNEY STEPHENSON.

XIII—EMBOLISM OF THE CENTRAL ARTERY OF THE RETINA IN CHILDREN.

(1) **Stephenson, Sydney.—Obstruction of the central artery of the retina in a girl of fifteen years.** *Reports of the Society for the Study of Disease in Children*, Volume VI, p. 46.

(2) **Poulard.—Mitral disease with embolism of the central artery of the retina in a child of nine years. (Maladie mitrale avec embolie de l'artère centrale de la rétine chez un enfant de neuf ans.)** *Bull. et Mém. de la Société Médicale des Hôpitaux*, 4 mars, 1908.

(1) **Stephenson's** patient, a girl 15 years of age, who had never menstruated, was seen the day following a sudden loss of sight in her left eye. The ophthalmoscopic appearances were

typical of so-called embolism of the central artery of the retina, the only peculiarity being that the normal red of the fundus was retained in an area contiguous to the lower outer part of the disc. This area, which was supplied by a cilio-retinal artery, retained sight enough to allow of the appreciation of shadows. It was about as large as the optic papilla. There was a history of subacute rheumatism, and, on examination, a faint mitral systolic bruit was heard. The cardiac lesions appeared to be compensated. It may be noted as a point of some little interest that the dark-red spot at the fovea centralis appeared in Stephenson's case to be due to ecchymosis, inasmuch as twenty-two days after the attack occurred it showed several small dots, of a yellowish white colour, such as may be seen when a hæmorrhage is undergoing metamorphosis. The author discusses the possible causes of the condition described by him as embolism, thrombosis, endarteritis, and arterial spasm, and concludes that his case was due to the cause first-named. He considers that the vision regained by the patient (6/60 in about three weeks) was probably due to the formation of a collateral circulation through the anastomosis of Zinn, although the shrinking of the clot in the artery cannot be put wholly on one side. G. C.

(2) **Poulard's** patient, a child of nine years, suddenly lost the sight of her right eye. The fundus, when examined a month later with the ophthalmoscope, showed a typical picture of embolism of the central artery of the retina. A very slight amount of sight remained in a limited portion of the retina supplied by a cilio-retinal vessel. The child presented a presystolic as well as a systolic murmur, with occasional reduplication of the second cardiac sound. The valvular condition seemed to be perfectly compensated. There were no evidences of syphilis, although that was somewhat suggested by the family history. Sometime before the embolic accident the patient had suffered from epistaxis and also from a suppuration of one finger. SYDNEY STEPHENSON.

XIV.—PARINAUD'S CONJUNCTIVITIS.

(1) **Trousseau.—On conjunctivitis with enlargement of glands. (Conjonctivite avec adénopathie.)** *Annales d'Oculistique*, T. CXXXVII, p. 444, juin, 1907.

(2) **Sinclair, Arthur H. H. and Shennan, Theodore.—A case of Parinaud's conjunctivitis, with a discussion of its pathology, especially in relation to the presence of the plasma cell.** *Transactions of the Ophthalmological Society U. K.*, Vol. XXVIII, Fasc. 1, 1908.

(3) **Bassères and Poujol.—A contribution to the study of Parinaud's conjunctivitis (a case with corneal lesions).** [Contributions à l'étude de la conjonctivite infectieuse de Parinaud (un cas avec lésions cornéennes)]. *Ann. d'Oculistique*, T. CXXXIX, p. 161, mars, 1908.

(4) **Lawson, Arnold.—A case of Parinaud's (?) conjunctivitis.** *Trans. Ophthal. Society U.K.*, Vol. XXVIII, Fasc. 2 1908.

(1) **Trousseau** records a case of conjunctivitis in a boy, aged 15, which was limited to the external third of the lower *cul-de-sac*, and accompanied by enlargement of the preauricular, submaxillary, parotid, and carotid glands, none of which, however, threatened to suppurate. On the eighth day there was slight gastric disturbance and fever, but in a week this had subsided, and, a month after the symptoms were first noticed, the patient was cured. Sections of an excised piece of the diseased conjunctiva showed infiltration with leucocytes; smear preparations and cultures contained only the micro-organisms commonly found in the conjunctival sac; inoculations of guinea pigs and rabbits gave negative results; and no spirillæ could be found. The author points out that his case differs from typical cases of Parinaud's conjunctivitis in the mildness of the lesions and the rapidity of the cure, and considers that although all forms of conjunctivitis with glandular involvement are usually considered to be of infective origin, there is frequently very little evidence in support of such an opinion. R. J. COULTER.

(2) Parinaud's conjunctivitis is so rare, and its ætiology so obscure that **Sinclair** and **Shennan** have given as full a report as they could of their case. The patient's failure to continue his attendance is responsible for the report being less complete on the experimental side than the authors would have liked, but the histological details are very full. The patient, aged 61, was first seen on July 30th, 1906, on account of swelling and redness of left eyelids, and by August 17th, there were three nodular masses on the conjunctiva of the upper lid and five on that of the lower; moderate general œdema of the conjunctiva: marked swelling of the preauricular and submaxillary glands, and even of the cervical glands in front of the sterno-mastoid. The preauricular gland had been the first to enlarge, about three weeks after the first appearance of the conjunctivitis. The larger and more prominent conjunctival nodules were umbilicated, measured about 3 mm., and were raised above the level of the conjunctiva. They appeared less vascular than the conjunctiva on which they were situated, were slightly opalescent, and gradually, later on, acquired a yellow tinge. Coloured plates show the nodules extremely well. There was no rise of temperature, and the general health was very little affected. The preauricular and submaxillary glands suppurated, and were opened, and some of

the conjunctival nodules were excised. By September 5th, the eye condition appeared nearly well. On October 9th, an abscess behind the sterno-mastoid was opened. On October 24th, there was a conjunctival relapse, associated with further pus collection near the cervical scars. A vaccine was prepared and injected on November 24th, but the patient was soon after lost sight of. In September, 1907, he was seen again: the eyes were perfectly normal. The authors then give an account of the "plasma cell," and its life history according to the views of different observers, because, according to Reis, and in this case of the authors, the granulations consist of closely-set plasma cells, which, in contradistinction to their arrangement in trachoma, are not aggregated into follicles. The histological changes in this case were found to depend on the formation in the subepithelial tissue, of a variety of granulation tissue, crowded with cells—plasma cells predominating—and containing numerous young blood-vessels. There were also superficial epithelial erosions and minute areas of necrosis in the deeper tissues. After detailing the histological appearances (illustrated by several fine photomicrograms) the authors say that the appearances observed in this case support the theory that plasma cells are, in the main, derived from lymphocytes. On such histological points, however, reference should be made to the original. As to bacteriology, cultures from the ulcers and necrotic areas, and from the preauricular gland, yielded *Staphylococcus epidermidis albus*. Cultures introduced into rabbits produced no lasting effects; but it was found that portions of granulations inoculated under the conjunctiva progressed to the formation of a distinct nodule, on condition that the staphylococci were inoculated subcutaneously. In controls without staphylococcic inoculation the subconjunctivally inoculated granulation was quickly absorbed. The microscopic appearances of the conjunctival nodule from the rabbit corresponded rather with those described as characterising trachoma in man.

The authors, while by no means satisfied that the staphylococci bore any ætiological relationship to the primary conjunctivitis, thought that vaccination with killed cultures was worth trying, and the patient's disappearance after two injections was unfortunate. They intend commencing vaccine treatment earlier should they meet with further cases. It will be interesting to note, they remark, whether there is any constant association of erosions of the conjunctiva with suppuration of the preauricular gland, and whether in the absence of erosions, the adenitis does not proceed to suppuration. ERNEST THOMSON.

(3) **Bassères** and **Poujol** give the history of a case of Parinaud's conjunctivitis, which occurred in a soldier aged 29 years. The enlargement of the glands and the clinical and microscopic lesions of the conjunctiva were typical, but the case ran a very slow course, during which an offshoot from the chemotic

conjunctiva spread over the upper edge of the cornea, to which it became adherent, ultimately causing softening and perforation with prolapse of the iris. At the beginning of the tenth month there was still some inflammation of the bulbar conjunctiva, with ptosis, the upper half of the cornea was opaque and the vision of the affected eye was reduced to less than counting fingers at 20 c.m. but might have been improved by an iridectomy, which was refused. Microscopic examination of sections of a specimen removed from the growth which invaded the cornea showed it to have the following structure.—The epithelium resembled that usually found at the sclero-corneal junction, but showed numerous karyokineses in the germinal layer and some infiltration with mononuclear and polynuclear leucocytes. In the subepithelial tissue there was continuous infiltration, consisting of a fine connective tissue network containing fairly numerous capillaries, some fixed connective tissue cells, and numerous other cells with rounded deeply-coloured nuclei. These were in some places closely packed together, but in other places were separated from each other by a fairly abundant semi-liquid, inter-cellular substance. Three varieties could be distinguished among them: (1) lymphocytes, (2) epithelioid cells of the type of mononuclear leucocytes with nuclei slightly larger than those of the lymphocytes and deeply stained, but with the chromatic grains very distinct and with well-developed protoplasm, and (3) polynuclear leucocytes. This infiltration, which was evidently the essential lesion, was quite uniform, and there were no trachomatous or tuberculous nodules, no giant cells and no foci of necrosis to be found.

The authors, while suggesting that the involvement of the cornea may have been accidental and due to a superadded infection—a view which is supported by the fact that the infiltration in the epicorneal growth was much denser and richer in leucocytes than that found in sections of the diseased conjunctiva—consider that their case shows that the view that lesions of the cornea never occur in Parinaud's conjunctivitis can no longer be maintained. R. J. COULTER.

(4) A morsel of the hypertrophied tissue removed from the patient whose case is reported by **Lawson** (London) showed, when examined microscopically, a small-celled infiltration of the follicular tissue. Bacteriologically, streptococcus pyogenes longus, non-virulent as regards a rabbit, and on two subsequent occasions no organism except the B. xerosis could be obtained. The condition, which affected both eyes, had lasted for about twelve weeks. Conjunctival granulations were well-marked, and the pre-auricular glands and also some of the cervical glands were enlarged. Age and sex of patient not stated by Lawson. Termination of case not known at the time of report.

XV.—MUSCLE-SPINDLES IN THE OCULAR MUSCLES.

Buzzard, E. Farquhar. — A note on the occurrence of muscle-spindles in ocular muscles. *Proceedings of the Royal Society of Medicine.* Vol. 1, No. 8. June, 1908.

It has been stated that spindles are absent from the extrinsic muscles of the eyeball. Siemuling, so far as Buzzard is aware, is the only observer who has described a spindle in an ocular muscle. **Buzzard** (London), in the course of an examination of a number of ocular muscles, has noted the occasional occurrence of structures resembling the spindles frequently seen in other parts of the body. These spindles in the eye muscles (if they really are spindles) differ from spindles in other muscles in that the capsule is comparatively thin, and that the intra-fusal fibres do not differ in shape or size from the extra fusal. As an explanation of their apparent absence from the majority of eye-muscles the author suggests that the capsule may usually be thinner and less easily recognizable than in the cases here shown, so that since the intra-fusal fibres are similar to the extra fusal, absence of a distinct capsule might lead to the spindles being overlooked. Buzzard distinctly states that his work on the subject is very incomplete, but that the results are sufficiently interesting to stimulate further efforts in the same direction before it is finally decided that the ocular muscles lack sensory organs similar or analogous to those of other muscles. Six photomicrographs illustrate the paper.

ERNEST THOMSON.

REMEDIES.

(1) **Connor, Leartus. — Remarks on vibratory massage in eye diseases.** *Trans. Amer. Academy of Ophthalmology and Oto-laryngology*, 1907, p. 277.

(1A) **Ideler.—On eusemine, a stable compound of cocaine and adrenaline.** *Therapeutische Monatshefte*, Juli, 1907.

1B **Kelly, John Muir. — A critical study of organic preparations of silver in the treatment of conjunctivitis.** *British Medical Journal*, November 23rd, 1907.

(2) **Mallannah, S.—Urotropine in night-blindness.** *Therapist*, February 15th, 1908.

(3) **Goldzieher, Vilmos.—The treatment of pannus following trachoma by inoculating the eye with gonnorhœal pus.** *Medical Press and Circular*, February 26th, 1908.

(4) Bock, Emil. — Sophol in eye work. (Sophol in der Augenheilkunde.) *Wochenschrift für Therapie und Hygiene des Auges*, 1908, No. 32.

(5) Valude, E.—Blepharospasm and injection of alcohol. (Blepharospasme et injection d'alcool.) *Annales d'Oculistique*, avril, 1908.

(5A) Roure.—On the treatment of infective keratitis by Formol. (Du traitement des Kératites infectieuses par le Formol, et des ses resultats au point de vue de la transparence des cicatrices.) *Rev. d'Hygiène et de Thérapeutique Oculaires*, avril, 1908.

(6) Bonsignorio. — Cacodylate of soda and arrhenal in ulcerations of the cornea. (Le cacodylate de soude et l'arrhenal centre les ulcerations de la cornée.) *Bull. gén. de Thérapeutique*, 15 mai, 1908.

(7) Parsons, J. Herbert. — Conjunctivitis in children. *Hospital*, June 27th, 1908.

(8) Sherwell, Samuel.—The technic of an efficient operative procedure for the removal and cure of superficial malignant growths. *New York State Journal of Medicine*, June, 1908.

(9) Lee, Charles G.—The treatment of corneal ulcerations. *Medical Press and Circular*, July 1st, 1908.

(10) Snell, Simeon. — Streptococcus infection of eyelids treated by antistreptococcus serum. *British Medical Journal*, July 4th, 1908.

(1) Vibratory massage as a means of treating some eye diseases was introduced in 1893 by Maklakow, who employed for the purpose Edison's electric pen (the point being covered with an ivory ball), vibrating about 9,000 per minute. **Connor** (Detroit) uses "a convenient and effective device for giving vibratory eye massage", run in connection with the street current, but he does not describe his apparatus more particularly. He resorts to the method only after other measures have failed or in connection with such measures when unsatisfactory. In incipient cataract Connor has found that the treatment usually causes an immediate increase in vision, a result that may be permanent but more generally is transitory. An illustrative case is quoted. The author also reports improvement in optic atrophy, retro-bulbar neuritis, anæmia of optic nerve and retina, embolism of central artery, and eye-strain not fully relieved by the most perfect correction of refractive defects and muscular imbalance.

SYDNEY STEPHENSON.

(1A) Eusemine is a stable solution including cocaine and adrenaline prepared by H. Rösenberg, of Berlin. **Ideler**,

assistant in Pollnow's klinik in Königsberg, has employed eusemine in 100 minor ophthalmic operations, such as entropion, tenotomy, removal of pterygium, sarcoma, etc., and operations for trachoma. The medicament was employed in the form of subconjunctival and subcutaneous injections, in almost all cases a Pravaz syringeful being used. The anæsthesia persisted for about fifteen minutes. No objectionable after-effects were observed. Owing to the convenient form in which eusemine is put up (fused glass tubes each containing one or two grammes), it appears to be especially indicated when an operation is to be performed at the patient's own home.

SYDNEY STEPHENSON.

(1B) **Kelly's** interesting article is partly a clinical and partly a laboratory investigation into the bactericidal powers of protargol and argyrol. The two drugs are compared with silver nitrate and other drugs as to their powers of destroying *staphylococcus pyogenes aureus*, and with various other drugs (*e.g.*, zinc sulphate and corrosive sublimate) as to their clinical action in Koch-Weeks and Morax-Axenfeld conjunctivitis. Argyrol and protargol samples were first submitted to gravimetric analysis, and it was found that the former contained 17.01 per cent. and the latter 7.03 per cent. of silver, as compared with 66.6 per cent. in silver nitrate. It was found that a 0·0039 per cent. solution of silver nitrate killed the *aureus* (emulsion of a three days growth) in five minutes, that a 1 per cent. solution of protargol was efficacious in the same time, but that a 50 per cent. solution of argyrol required about 24 hours to kill the organism. The results are compared in a table with those of Marshall and Neave and of Derby, and all of them show that, as a bactericide, the nitrate is very strong, and is superior to protargol, whilst argyrol has only faint bactericidal properties. Again, agar-agar tubes containing three days' growths of the *aureus* were filled up with solutions of protargol and silver nitrate. After certain periods the solutions were poured off, sterilized water was run over the growths, and then other slants were inoculated from the thickness of the growths. About 70 experiments resulted in the conclusion that 0·50 per cent. silver nitrate killed the organisms in 30 minutes, while it required a 30 per cent. solution of protargol to kill them in that time. From the two series of experiments Kelly concludes that the bactericidal power alone of silver nitrate is 263 times that of protargol, but that the latter has greater powers of diffusion, which do not, however, sufficiently compensate for the superior bactericidal powers of silver nitrate.

As regards the **pain** caused by the drugs, the author's personal experience is that whilst 20 per cent. argyrol is quite unirritating, 0.50 per cent. silver nitrate and 20 per cent. protagol cause discomfort for 25 and 35 minutes respectively. Interesting experiments were made with other drugs.

Carbolic acid, 1 in 20, killed the *aureus* in 20 minutes.

Corrosive sublimate, 1 in 500, killed the *aureus* in 20 minutes.

Potassium permanganate, 1 in 400, killed the *aureus* in 20 minutes.

As regards lotions, the only lotion which killed the *aureus* in a 24 hours' growth after 24 hours' exposure was MacKenzie's lotion (1 in 4,000 corrosive sublimate).

The action of protargol and argyrol on Koch-Weeks' conjunctivitis was investigated by using the drug in one eye and boric or normal saline in the other, in 40 cases altogether. It was found that protargol irritates, whilst argyrol, being mildly astringent, lessens discomfort, but that is all the benefit. The duration is not shortened. In Morax-Axenfeld conjunctivitis both drugs were quite inefficacious.

The paper, which presents results in tabular form, should be read in the original. ERNEST THOMSON.

(2) **Mallannah** (Hyderabad) believes that torpor retinæ, as shown by night-blindness, xerosis, and pigmentation of the conjunctiva, results from a diminished alkalinity of the blood, and for this hypothetical cause he consideres urotropine, administered internally, to be a specific.

SYDNEY STEPHENSON.

(3) **Goldzieher** (Budapest) advocates anew a trial of the ancient plan of inoculating with gonnorrhœal pus eyes affected with trachomatous pannus. He has treated three cases in this way. Goldzieher considers that the method is not more dangerous than the use of jequirity (de Wecker) or of jequiritol (Roemer). The conclusive indication for its application is the existence of a so-called "pannus crassus." The method has according to the author, one great point in its favour, namely, the fact that it not only clears the opaque and vascular cornea but also cures the under-lying trachoma.

SYDNEY STEPHENSON.

(4) **Bock** (Laibach) has employed sophol — *i.e.*, a formonucleinic compound containing 20 per cent. of silver—in the treatment of several forms of eye disease. Sophol occurs as a yellowish-white powder, readily soluble in water. Solutions must be made with cold distilled water, and it is advisable to use only fresh solutions. In reference to the last point, however, Bock was unable to convince himself that a solution a month old had undergone any deterioration as regards either its chemical or its pharmacological properties. The author has experimented with 5 per cent. to 10 per cent. solutions, but he now has adopted the former as adequate to most purposes. It is applied to the conjunctiva, exposed by eversion of the eyelids, by means of cotton wool wrapped round a wooden applicator, as a match stick. Bock has employed sophol in the treatment of all diseases of the conjunctiva, except spring catarrh and gonorrhœal ophthalmia, no examples of which have recently fallen under his notice. In ophthalmia neonatorum he has

found that sophol quickly reduces the amount of discharge, but it does not influence to the same extent the swelling of the conjunctiva. Silver nitrate (1 per cent.—2 per cent.) is preferable under the circumstances. In acute conjunctival catarrh the 5 per cent. solution speedily subdued the discharge, and relieved such symptoms as photophobia, heat, and irritation. No pain is caused by the application, thus affording an instructive contrast with the effects of silver nitrate. In "scrofulous" conjunctivitis and keratitis sophol is of considerable service. In recent trachoma sophol reduced discharge satisfactorily, although it exerted no particular influence upon the swollen conjunctiva or the trachoma bodies. Photophobia is markedly influenced. In lacrymal affections the action of sophol resembles that of protargol. Neither remedy, of course, can pretend to affect a radical cure of dacryocystitis. Bock sums up the advantages of the new silver preparation by claiming that it is a mild, non-irritating, and efficient bactericide, despite its superficial action. SYDNEY STEPHENSON.

(5) **Valude** (Paris) records 3 cases of blepharospasm treated by injections at the point of emergence of the facial nerve of from 1 to 1.5. c.c. of 80 per cent. alcohol combined with cocain or stovain. The first was of very old standing, and so many remedies had been tried that the patient had given up all treatment. The injection was rapidly followed by facial paralysis, with difficulty in swallowing and speech, which lasted so long that owing to anxiety as to the condition of the cornea from faulty closure of the lids and absence of nictitation a weak faradic current was applied to the facial muscles a few times, with the result that their movements soon returned. The cure lasted three months, after which time the symptoms gradually returned. The second case was complicated by neuralgia and belonged to the class commonly called "tics." The injection was followed by facial paralysis with relief of the pain, but caused excessive salivary secretion on the corresponding side of the tongue on mastication. At the end of $2\frac{1}{2}$ months there had been no return of the pain or spasm and the salivary hypersecretion persisted. In the third case the injection was followed by facial paralysis with lagophthalmus and difficulty in swallowing. This condition persisted for a month, when owing to commencing involvement of the cornea, applications of the continuous current were made to the eyelids, with the result that the lagophthalmus quickly disappeared. At the end of $2\frac{1}{2}$ months there had been no return of the spasm.

The author considers that this treatment is an excellent one for facial spasms alone or complicated by neuralgia which do not yield to ordinary therapeutic measures, and that the resulting paralysis should be left to run its own course unless there is any sign of danger to the cornea. R. J. COULTER.

(5A) For the last twelve years infective ulcerations of the

cornea have been treated by **Roure** (Valence) with formol, 1 : 100, applied twice a day directly to the lesion. The eye is previously rendered anæsthetic by means of cocaine, 1 : 40. The eye is kept bandaged between successive applications of the formol. Atropine (5 per cent. to 10 per cent.) is generally used after the cauterisation. Besides this, methylene blue is applied every two or three days, in order to trace the progress of the ulceration. When the aniline colour is not longer fixed, showing that the epithelium has been regenerated, the formol is discontinued. By this method of treatment Roure is persuaded that he obtains relatively transparent nebulæ.

SYDNEY STEPHENSON.

(6) The organic derivatives of arsenic, cacodylate of soda and methylarsinate (*Arrhénal*) have been employed by **Bonsignorio** in superficial and deep corneal ulcerations and in ulcerative blepharitis, with good effect. Cacodylate of soda is used in 3 per cent. solution and in 2 per cent. ointment. Arrhenal is used in 3 per cent. solution. In ulcerative blepharitis, after having removed the crusts, cacodylate ointment, 2 per cent., is applied along the lid edge every night for a week, then every second night for a week. It is said by Bonsignorio that in these cases the improvement is rapid and real. ERNEST THOMSON.

(7) In the treatment of ophthalmia neonatorum **Parsons** (London) prefers the 2 per cent. silver nitrate solution to the newer organic compounds of silver. In his opinion, the silver should be painted on the everted conjunctiva not oftener than once a day, no matter how severe the case may be. In diphtheritic conjunctivitis Parsons, of course, gives antitoxin by subcutaneous injection, but he also applies it direct to the conjunctiva. He has found "such local treatment beneficial for this form of conjunctivitis." SYDNEY STEPHENSON.

(8) Without in the least disparaging the results that may be obtained from radium, x-rays, or surgical excisions, **Sherwell** (Brooklyn) advocates the treatment of superficial malignant growths by a method employed by him on an extensive scale during the last thirty-five years. The plan in question consists in the thorough and deep use of the curette (which should be provided with a clean, wire edge), followed at once by the application of an escharotic, such as a 60 per cent. solution of the acid nitrate of mercury. The latter is allowed to remain in contact with the parts for from ten to twenty minutes. The final step is to neutralize the caustic agent by means of sodium bicarbonate, of which a small quantity is powdered over and pressed into the wound. No dressing is applied. Bandages are useless as well as annoying. The scab should be allowed to remain undisturbed until such time as it falls off, which it usually does in two to three weeks. General anæsthesia may or may not be required. Under any circumstances, prior to operation, Sherwell injects a little cocaine about the edge of the affected

FIG. 1.—BEFORE OPERATION.

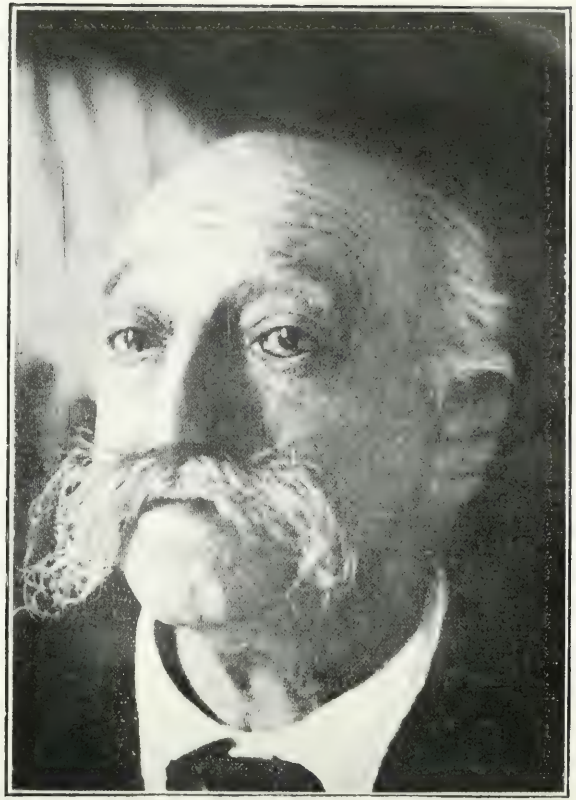


FIG. 2.—AFTER OPERATION.

part, and also administers a hypodermic of morphin (gr. $\frac{1}{4}$ to gr. $\frac{1}{3}$), with or without atropin. Bleeding after use of the curette may be stopped by a touch of the Paquelin cautery. Oozing is controlled by the application of a solution which contains adrenalin and cocain. The acid nitrate of mercury is applied by small mops of cotton wool, tightly wrapped round a wooden match or toothpick. After the operation, Sherwell invariably puts his patient on a course of arsenic, which he believes has a kind of inhibitory action upon the cells of sarcomata, epitheliomata, and possibly of true carcinomata as well. Figs. 1 and 2 show the results before and after operation in one of Sherwell's patients. SYDNEY STEPHENSON.

(9) **Lee** (Liverpool) in grave forms of corneal ulceration, recommends a collyrium introduced by Richard Williams, namely, Quin. Sulph. Acidi, grs. 2; Atropin. Sulph., grs. 2; Distilled Water, drachms 4. If the ulceration be peripheral, then physostigmine sulphate (gr. 1) is substituted for the atropine. In addition to this, sublimate lotion, 1 : 5,000, is also used. In specially virulent infections, the actual cautery, applied at a dull-red heat, may be required. Lee is a strong advocate of subconjunctival injections of mercury in sloughing ulcers of the cornea. He believes that such injections should be made early in the history of the case, as well as when the cautery has failed. He injects about thirty drops of a 1 in 1,000 solution of oxycyanide of mercury, and repeats the injection in forty-eight hours if necessary. To quote his own words:—"Often the results are quite striking; an eye which before the introduction of this method we should unhesitatingly have condemned may now be saved, and often a useful amount of vision restored. In other cases, eyes which would have been passed on to panophthalmitis are stayed in their pernicious course, and albeit they have no sight, are retained in the orbit, and the patient saved the agonising pain of panophthalmitis". SYDNEY STEPHENSON.

(10) **Snell's** patient, a man aged 36 years, suffered from toxæmia as the result of suppuration in the substance of the lids of the right eye of seven days' duration. The source of infection could not be traced. Albumen was present in the urine, and, on admission, the temperature was 103.6°F., and the general condition was extremely grave. Streptococci were found in pure culture from the suppurating eyelids. Three subcutaneous injections (each of 10 c.cm.) of polyvalent antistreptococcus serum were administered on March 19th and 20th, and on the following day the temperature had fallen to below normal, and the delirium, present before, had abated. Final result good.
SYDNEY STEPHENSON.

REVIEWS.

Nouveaux Eléments d'Ophtalmologie. Par H. TRUC, Professeur de clinique ophtalmologique à la Faculté de Montpellier; E. VALUDE, Médecin de la clinique ophtalmologique Nationale des Quinze-Vingts; et H. FRENKEL, Professeur agrégé chargé de cours de clinique ophtalmologique à la Faculté de Toulouse. Deuxieme édition. Pp. xvi et 981. Avec 282 figures dans le texte et 15 planches en couleurs. Paris: A Maloine, Editeur, 1908. Price 24 francs, 21 francs 50 net.

The second edition of Truc and Valude's text-book, although it spreads out into 981 pages, is essentially an elementary work. For its size we would consider it almost too elementary. We have read through several different subjects, and nowhere do we find any detailed account given. The optical portion is very brief; the theory of the shadow test is dismissed in a paragraph. The theories of accommodation of Helmholtz and of Tscherning are mentioned, but in that connection, although many names are quoted, the authors do not seem to have heard of Hess. The account of conjunctivitis suffers from the authors having seemingly restricted their attention to the French literature on the subject. What can have been the experience of surgeons who in talking of trephining for optic neuritis, say, "*mais il faut se borner à trepaner sans inciser la dure-mère*"?

While we think that the authors might have omitted much, *e.g.* the chapter on the æsthetics of vision and the artistic eye, and given more attention to some more useful subjects, we must record our admiration for the clarity of their writing generally. The coloured plates of retinal conditions are lamentably bad. If the book were reduced in size to about one-third of its present bulk, it would then be an excellent work to put in the hands of a student commencing the study of ophthalmology.

LESLIE PATON.

Gynäkologie und Geburtshilfe in ihren Beziehungen zur Ophthalmologie. Von Dr. ERNST RUNGE, Asst. a.d. Universitäts-Frauenklinik d. Kgl. Charité zu Berlin. Leipzig: Verlag v. Johann Ambrosius Barth. 1908. S. 164.

This is one of those very useful catalogues of published cases which are so serviceable to all who wish to do any critical work. The bibliography dealt with extends to 784 numbers and is probably on the whole accurate, though there are some obvious divergencies in the British items. The chapters are arranged according to the main genital functions and abnormalities, and the accidents to the child with special chapters on Basedow's

disease and ophthalmoblennorrhœa. In each chapter the cases and opinions quoted are arranged under ophthalmological categories. It is a matter for regret that the author does not give any critical digest, though there is perhaps something to be said for leaving that function to the individual worker.

R. C. BUIST

Transactions of the Twelfth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology. Held at Louisville, Ky., September 26th, 27th, 28th, 1907.

This well-produced volume contains an account of the last meeting of the American Academy of Ophthalmology and Oto-Laryngology. The first section deals with the latter and the second with the former specialty. Most of the communications have already been published in periodical literature, although we do not recollect to have seen an interesting contribution by Dr. Adolf Alt "On the musculus dilatator pupillæ," beautifully illustrated with seven cuts. Dr. Leartus Connor writes enthusiastically upon the benefits of vibratory massage in certain eye affections. Dr. George F. Suker enquiries whether a substitute for simple enucleation can be employed in every instance, and answers his own question in the affirmative. "Whenever an enucleation is indicated or performed," Suker writes, "some substitute which will yield a more prominent stump is not only indicated, but absolutely justifiable."

Bulletin de la Société belge d'Ophtalmologie, No. 24, Bruxelles: Imprimerie Scientifique L. Severeyns, 44, Montagne aux Herbes-Potagères, 1908.

This slim, paper-backed volume represents the proceedings of the twenty-fourth meeting of Belgian Ophthalmological Society held at Brussels on April 26th last. It contains accounts of cases by Van Duyse, Marbaix, Rutten, Coppez, and Tacke. There are three communications dealing with nystagmus by Nuel, Pohl, and Dransart and Famechon respectively.* Pergens writes on the ocular manifestations of sclerodermia pigmentosum (Kaposi's disease), Ridder on the results elicited by the ocular inspection of the communal schools of Brussels, and de Lantsheere on the notation of visual acuity in medico-legal reports. The volume is illustrated and includes two plates in colours of an extraordinary case by Coppez in which the optic discs were surrounded by a vascular circle lying beneath the retinal arteries and veins.†

*For abstract see page 631 of the present issue of THE OPHTHALMOSCOPE.

†For abstract see page 623 of the present issue of THE OPHTHALMOSCOPE.

Guide du Médecin Oculiste dans les accidents de Travail. Par le Dr. CAILLAUD, Assistant-Adjoint d'ophtalmologie des hôpitaux de Paris. Paris : Jules Rousset, 1908. Price, 3fr. 50.

Not the least interesting point about this little guide is the fact that it is published ten years after the French Compensation Act of April 9th, 1898, came into force. Dr. Caillaud has consequently been able to speak with the authority of experience as to its working. Nevertheless, with the object of producing a complete *vade-mecum* for the ophthalmic surgeon on the subject of workmen's accidents, he calls upon his confrères to assist him with interesting information bearing upon the subject both from the general and from the ophthalmic point of view.

The first chapter is devoted to the methods of examining the injured. Especial stress is laid upon the importance of early examination of the visual acuity after the accident, and before the patient has taught himself, or has been taught by others, the market value of simulation.

The second chapter is devoted to certificates, the first being required to be sent in within four days of the accident, and for supplying this the surgeon receives a fee of 8 francs. There are many points of resemblance in the French and English laws, suggesting that the latter is based upon the former, possibly this is one of the effects of the early stages of the *entente cordiale*. The French *ouvrier* does not begin to draw his half pay until after the fifth day, and if he is laid up more than ten days, he draws his half pay from the date of the accident. The English workman draws half-pay during incapacity, unless that incapacity lasts less than 14 days, when he gets nothing for the first week. The third chapter deals with "hospitalization" and sets forth the cases which should be admitted into hospitals for the poor, and the fees to be exacted for their treatment there.

The fourth chapter is devoted to simulation, and describes the usual methods for its detection by means of convex glasses, the diploscope, etc.

The rest of the book is devoted to the tariffs, reports, and responsibilities of oculists, the valuation of the damage done to the eye and the indemnity to be accorded, and it ends with an interesting account of the various laws and ministerial circulars on the subject of workmen's compensation. As an interpretation of the legal aspects the book is most useful. The many pages devoted to the payment of the expert show that the fees do not err on the side of extravagance. For the workman suffering from absolute permanent incapacity from following his employment it is laid down that he shall receive an annuity equal to two-thirds of his wages. But if the incapacity is only a partial and permanent one he receives half the reduction caused by the accident. The workman who, in spite of permanent

incapacity, can still earn his full wages, receives no compensation for such incapacity. The author points out the importance of considering the nature of the work of the employé, instancing the case of a man suffering from traumatic cataract. A blind eye, he says, is often less a disadvantage than a unilateral aphakic one, and therefore the results to binocular vision must be considered before operating in such cases.

The clinical side of the book is meagre, and this reduces its value to the English reader. But as a guide to the various legal aspects, and the duty of, and the fees payable to, the surgeon called upon to deal with accidents to workmen, it is of great value to French surgeons.

Dr. Caillaud is to be congratulated on the thoroughness with which he has carried out his task. The volume is well got up and the printing is good, but it has the usual disadvantage of French medical works in being issued in paper covers. For books belonging to the group Ephemeridæ this is of little consequence, but for books of reference, which we wish to place on our shelves, it has decided disadvantages.

W. M. BEAUMONT.

CORRESPONDENCE.

The Royal Society of Medicine.

To the Editors of THE OPHTHALMOSCOPE.

DEAR SIRS,

I have just seen the paragraph referring to this Society, on page 562 of the last issue of THE OPHTHALMOSCOPE.

Of course it is impossible to say what may be in the minds of individual Fellows, or what informal talk upon the subject may be going on; but I think it is only fair to your readers to say that there is not the slightest justification for any such statement, so far as the Council and Officers are concerned. It would (in my humble opinion) be a grave mistake, under existing circumstances, to set up a rival Section in Ophthalmology.

Yours very truly,

J. Y. W. MAC ALISTER,
Secretary.

20, Hanover Square, W.
3rd July, 1908.

NOTES AND ECHOES.

Deaths.

We regret to announce the death on June 10th last, of Victor Deneffe, of Ghent, Belgium. He was an authority upon ancient ophthalmology, and the author of several treatises upon such subjects. The deceased, who was 73 years of age at the time of his death, was Emeritus professor in the university of Ghent. Horace G. Miller, of Rhode Island, a prominent ophthalmologist, is dead at the age of 68 years. He had filled with distinction the offices of president of the New England Ophthalmological Society and of the American Otological Society. Kent O. Foltz, of Cincinnati, the author of a book on diseases of the eye, died on June 6th, aged 51 years.

* * * *

Scientific Meetings.

At the forty-fourth annual meeting of the American Ophthalmological Society, held on July 15th and 16th, at New London, Connecticut, U.S.A., Major Henry Smith, I.M.S., read by invitation a paper on "The Treatment of Immature Cataract." The American Academy of Ophthalmology and Oto-Laryngology will hold its annual meeting on the 27th, 28th, and 29th of August at Cleveland, Ohio, and Mr. J. B. Lawford, of London, will be the official guest of the Academy. The Ophthalmological Society of Heidelburg will assemble on the 5th, 6th, and 7th of August next. A very full programme of communications and demonstrations has been arranged.

* * * *

Section of Ophthalmology, American Medical Association.

At the last meeting of the Section of Ophthalmology of the American Medical Association held at Chicago in June last, Dr. A. A. Hubbell, of Buffalo, New York, was elected chairman, Dr. M. Black, of Denver, Colo., vice-chairman, and Dr. A. E. Bulson, junior, of Fort Wayne, secretary. Dr. T. A. Woodruff, of Chicago, was appointed to act as delegate at the next meeting of the section, which is to be held at Atlantic City, New Jersey, in June, 1909.

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Harlem Eye, Ear, and Throat Infirmary.

The Harlem Eye, Ear, and Throat Infirmary of New York City, New York, an institution that handles several thousand eye patients yearly, is constructing a new building.

* * * *

Oxford Ophthalmological Congress.

SEVERAL features of unusual interest marked the Third Oxford Ophthalmological Congress held on the 16th and 17th of July. Sir Victor Horsley's address on the surgical treatment of optic neuritis and atrophy may be summed up by saying that surgical intervention was recommended in every case. Sir A. Wright's address on vaccine therapy was appreciated by a crowded audience, although the lecturer confined his remarks mainly to the financial position of the members of the medical profession and to the principles involved in the new method of treatment. Mr. George Coats's demonstration of retinal diseases accompanied by massive exudation attracted much attention, and represented considerable labour. Mr. E. Treacher Collins's address on congenital cataract will be found in the present number of THE OPHTHALMOSCOPE. Some of the demonstrations, including that on opsonic methods by Dr. Bryan, photo-electric changes by Professor Gotch, the measurement of colour-sensations by Professor Burch, the accessory nasal sinuses by Mr. A. P. Parker, the Calmette reaction by Mr. P. H. Adams, and the reconstruction model of the eye of a human embryo, 13mm. in length, by Professor Arthur Thomson, were most interesting. A word of praise should be bestowed on the beautiful microscopical sections exhibited by Mr. Gradon to illustrate some points in the development of the ciliary body and suspensory ligament. An interesting discussion upon the burning question of amalgamation between the Ophthalmological Society on the one hand, and the Royal Society of Medicine on the other, took place after dinner on July 16th, in the Junior Common Room at Keble College. Amalgamation was advocated by Mr. A. W. Ormond, and opposed, amongst others, by Sir H. R. Swanzy, Messrs. Johnson Taylor, Sandford, and Stephenson. It was evident from the tone of the discussion that many of those present still believed in the applicability of the old rhyme to the situation :—

There was a young lady of Riga,
Who went for a ride on a tiger ;
They came back from the ride
With the lady inside.
And a smile on the face of the tiger.

The cases collected at the Oxford Eye Hospital were numerous and interesting. The members took tea with Professor and Mrs. Osler on the afternoon of the 17th. On the following day a most successful gathering was brought to an end by a launch excursion on the Thames from Folly Bridge, Oxford, to Reading.

* * * *

Presentation to Mr. R. W. Doyne.

ONE of the most interesting things about the Oxford gathering was the proposal that a testimonial should be given to Mr. Robert W. Doyne, Reader in Ophthalmology in the University, to

whose initiative and energy the meetings are due. The suggestion was made at lunch in Keble College on the first day of the gathering by Sir H. R. Swanzy, and received with acclamation by those present. A very substantial sum was speedily forthcoming. A handsome silver bowl and a silver loving cup were presented to Mr. Doyne on July 30th, at the Royal Infirmary, Sheffield, during the meeting of the British Medical Association.

* * * *

Committee on Ophthalmia Neonatorum.

THE Council of the British Medical Association at a meeting held on July 1st, 1908, appointed a special committee to consider the question of the prevention of ophthalmia neonatorum, and to report thereon. The committee consists of Dr. Buist, Mr. Sydney Stephenson, Dr. Cecil Shaw, and Dr. Helm, together with the Chairman of the Science Committee of the Association Dr. Martins, F.R.S. The Council, moreover, invites the co-operation of each of the following Societies:—(1) the Ophthalmological Society; (2) the Obstetrical and Gynæcological Section of the Royal Society of Medicine; (3) the Society for the Study of Disease in Children; and (4) the Incorporated Society of Medical Officers of Health. The Central Midwives Board is requested to co-operate by sending a representative.

* * * *

Worshipful Company of Spectacle Makers.

AT an adjourned quarterly meeting of the Court of the Worshipful Company of Spectacle Makers held recently donations were voted to the Royal London Ophthalmic Hospital and to the Royal Eye Hospital, Southwark.

* * * *

Standardization.

AN important report, the contents of which should be familiar to every ophthalmic surgeon, was presented to the Optical Society on June 18th last. It deals with the standardization and certification of cases of trial lenses, and was prepared with the help of the National Physical Laboratory. As regards the powers of lenses, it is recommended that:—1. The neutralisation method of testing for power be accepted as the basis for the scheme of standardization to be adopted; 2. The true powers of the negative lenses be required to agree with the values marked on the lenses or their mounts; 3. The standard thicknesses and powers for the positive lenses be such that the positives will neutralise the corresponding negatives; 4. A statement giving the true powers of the standard positives be required to be pasted in each trial case sent for certification to the National Physical Laboratory. The report points out that the base-line of

a prism should be indicated by two marks and not by one alone, as is commonly done. When a prism is mounted so that one face is flush with the rim, the markings should be on that face. With regard to the powers of prisms, this is measured by the minimum deviation, expressed by the number of centimetres displacement produced in an object at one metre distance. The unit is called the "prism-dioptre" (△). It is recommended that as regards the centreing of lenses, every effort should be made by the manufacturer to keep the error below ½mm. in the higher powers. Certain limits of permissible error are fixed by the report. The final recommendations are directed towards providing a series of neutral-tinted glasses of standard transmission value.

* * * *

A Diploma in Ophthalmology.

THE circular issued by Professor Osler to Oxford medical graduates with reference to the desirability or otherwise of granting a diploma in ophthalmology to non-graduates of the University has resulted in an expression of opinion not wholly adverse to the scheme. It would be premature to say more at the present juncture.

* * * *

Eye Infirmary, Exeter.

FROM a recent issue of the *Lancet* we gather that the Committee of the West of England Eye Infirmary at Exeter has opened a fund with the object of celebrating the centenary of the institution, which was founded in the year 1808. It is hoped by this means to raise £3,000 for the purpose of replacing the "present dilapidated and insanitary old building by a new wing."

* * * *

Penal Cases at the Central Midwives' Board.

AT recent meetings of the Central Midwives' Board, there were several penal cases of interest to ophthalmic surgeons. There were a couple of instances of loss of sight as the consequence of neglect. A Leeds midwife characterised a case of ophthalmia neonatorum as "a blast in the eye," and advised against a medical man being called in. In the result, the sight of one eye was lost and that of the other very seriously affected. In another case the midwife described the ophthalmia as "only a cold." A midwife was charged with employing an unqualified person as her substitute, and with failing to send for medical help for a child with ophthalmia neonatorum.

* * * *

British Ophthalmic Hospital at Jerusalem.

H.M. THE KING has appointed the Earl of Plymouth Chairman of the British Ophthalmic Hospital, Jerusalem. The institution, as readers are doubtless aware, belongs to the Order of St. John of Jerusalem in England.

* * * *

Ophthalmological Society.

THE following office-bearers were elected at the annual general meeting of the Ophthalmological Society of the United Kingdom, held on July 10th last:—President, R. Marcus Gunn. Vice-Presidents, W. Adams Frost, George Mackay, W. H. H. Jessop, R. A. Reeve, Priestley Smith, Gustavus Hartridge, Joseph Nelson, James Taylor, and J. C. Uhthoff. Treasurer, J. B. Lawford. Librarian, W. T. Holmes Spicer. Council, A. S. Percival, J. S. Risien Russell, Cecil E. Shaw, W. G. Sym, Harold Grimsdale, W. T. Lister, C. Devereux Marshall, Cyril H. Walker, E. Farquhar Buzzard, Arnold Lawson, William G. Laws, and A. Maitland Ramsay. Secretaries, F. E. Batten and J. Herbert Fisher.

* * * *

State Help for the Blind.

BY a Labour Party Bill published recently, County and Borough Councils and the Exchequer must divide between them the cost of certain schemes for the blind. These include:—1. maintenance of the blind who are unable to work; 2. the supply of raw material at cost price to blind home-workers; 3. technical schools for a five years' course for the blind over sixteen years of age; and 4. the equipment of municipal workshops for the blind.

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CONTENTS.

Original Communications—

1. Sir Victor Horsley, F.R.S.—The Operative Treatment of Optic Neuritis 658
2. E. Treacher Collins, F.R.C.S.—Developmental Deformities of the Crystalline Lens (*concluded*) 663

Clinical and Therapeutical Memoranda—

1. McCluney Radcliffe, M.D.—Thyroid Extract in Keratitis 676
2. Sydney Stephenson.—A case of Incomplete Congenital Ophthalmoplegia Externa, with Remarks 678

Novelties—

1. An Ointment Diluter.—By Charles Wray, F.R.C.S. 684
2. A Modification of Axenfeld's Retractor.—By T. Harrison Butler, M.D. 685

Review—

Some Recent British Work upon Standardisation.—By W. A. Dixey ... 686

Translation—

Bifocal Lenses.—By M. Tscherning 691

Current Literature—

I. Heat-Rays and Hypermetropia 694
II. The use of Cycloplegics in Refraction Work 694
III. Subconjunctival Extraction of Cataract 696
IV. Pathology 699
V. A Test for Binocular Vision 706
VI. A New Eye-Symptom in Rabies 707
VII. Some Ocular Manifestations of Hysteria 708
VIII. The Calmette Reaction... 710
IX. Injuries of the Eyes and their Treatment 712
X. Vascular Changes in Syphilis 713
XI. The Ocular and Dental Stigmata of Inherited Syphilis 715
XII. Transplantation of the Cornea 717
XIII. Diabetic Paralysis of Accommodation 718
XIV. Tumours of the Caruncle 718
XV. Interstitial Keratitis 719
XVI. Instruments and Appliances 720

Correspondence 724

Book Notices 725

Notes and Echoes 732

ORIGINAL COMMUNICATIONS.

THE OPERATIVE TREATMENT OF OPTIC NEURITIS.*

BY

SIR VICTOR HORSLEY, F.R.S., F.R.C.S.

SURGEON TO THE NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC AND CONSULTING SURGEON TO UNIVERSITY COLLEGE HOSPITAL, LONDON.

I am greatly obliged to this Congress, especially to Mr. R. W. DOYNE, for affording me this opportunity of communicating one of the brief papers of the meeting, and on a subject in which I am especially interested, namely, optic neuritis and its surgical treatment, although by such a term one would naturally mean all forms of papillitis which accompany a new growth or inflammation.

I would point out, at first, that optic neuritis is produced by a combination of factors, of which the only one we know to be certainly present is a rise of intracranial tension or pressure.

I wish to begin with asserting that the prime factor in optic neuritis is this rise of the intracranial pressure, and I would point out to you that even though where we know toxæmias to be also present, the actual effect due to the action of toxins is not yet known. Moreover, in uræmic conditions we find that even *post-mortem* the brain is still swollen, turgid, and engorged. Now that release of such intracranial tension arrests and cures optic neuritis was first published by myself about twenty years ago, and this fact has been confirmed by very many surgeons and physicians during that period. There are, however, several points of importance which I desire to lay before the Congress in respect of the details both of the condition itself and of the proposed treatment : points which I venture to think, and have evidence to prove, are of clinical value because of the help they afford in establishing what is all-important to the operating surgeon, namely, the differential diagnosis of the seat of disease.

Perhaps it would be more convenient if I discussed the method of operating first, namely, how much is to be done in cases where the disease causing the neuritis cannot be diagnosed and be directly localised and operated upon.

Opening the Skull.

The skull of course being a rigid box, it follows that making a fair-sized hole in it would afford a certain degree of release of pressure. I have often myself seen in the first stage of an operation cerebral tumour, that is to say, after the simple

* A communication to the Oxford Ophthalmological Congress, July, 1908.

opening of the skull, that the optic neuritis slightly subsides. In a recent case in which I also punctured the hemisphere, the subsistence was so considerable (2.5 D.) that the second stage was postponed. But my experience has invariably been that unfortunately simple opening of the skull is not sufficient. I am well aware that cases have been published which seem to contradict this in special instances. I can only say that it has not been my good fortune to meet with them, and therefore I should advise that the dura mater be invariably opened.

Opening the Dura Mater.

The opening of the dura mater must be free—for instance, 5 c.m. It has not infrequently been observed that a small opening is not sufficient because, I presume, the severe pressure in the brain plugs the aperture with cerebral substance.

Tapping.

Since there is notable intra-ventricular pressure it might be justly inferred that by means of tapping the lateral ventricles through a simple bore-hole the neuritis might be relieved and the necessity for a cutting operation avoided. Further, that such tapping might be performed on the theca of the spinal cord and fluid drawn off by lumbar puncture, or the lateral ventricle might be drained in the usual way.

On this point I can but recount my own experience, especially as I have performed the last operation deliberately in cases where it was impossible to treat the disease directly.

I am sorry that I cannot recommend the procedure. What subsidence of neuritis was obtained was temporary, and although some relief has been given to headache by such tapping that relief, also, is not permanent.

To summarise therefore all opinions on this point the conclusion would probably be, that it is better to make a considerable opening in the skull and dura mater.

There remains the question in what region of the brain this may best be done.

There are two places where the arachnoid forms a cisterna which can readily be approached, and of these the more important is the intrapeduncular cisterna, which lies, of course, immediately beneath the floor of the third ventricle. The procedure I advocate therefore for this purpose is the making of a large oval opening in the temporal region (practically the removal of the squamous bone), free incision of the dura mater, and the pushing back and slightly raising the temporal lobe of the brain. This, I think, affords the most certain relief, and therefore it might be spoken of as the operation of selection.

But we have not considered the second cisterna, namely, that beneath the cerebellum. This can readily be approached by trephining the occipital bone and prolonging the aperture into

the foramen magnum. On opening the dura, it is readily seen that the arachnoid in this region is attached high up on the cerebellum, and the cisterna can be opened at once without difficulty.

It has been suggested that subcerebellar release of the pressure is not so certain as the operation above the tentorium. Personally, I have not seen a difference, but naturally in view of the facts that one of the commonly associated conditions with neuritis is undoubtedly syphilitic meningitis or leptomeningitis, it follows that there may be some adhesion and block around the mid-brain where it perforates the tentorium and, of course, obstruction in the aqueduct itself. Under such circumstances the relief to meningitis may be imperfect, but inasmuch as the vast majority of operations in this neighbourhood have been for the removal of neoplasms I have not seen the persistence of neuritis that has been suggested. In recommending generally the temporal route, therefore, I cannot say that it is essential to open the skull thereby instead of by the occiput, but, as I said before, I would always prefer to do this in any case where it is impossible to locate the disease and to attack it directly.

Few things are more striking after an operation for cerebral tumour than to see the rapidity with which the swelling and the degenerative changes of the disc and retina clear up. Certainly, this seems to occur with the same rapidity where the operation is performed above or below the tentorium.

A final word on the risk of such operative treatment of optic neuritis will not be out of place. Of course, thanks to Lord Lister, the simple bore-hole and the release of fluid ought to be an operation unattended by any risk to the patient if the aseptic *technique* is adequate.

I will now take the other side of this subject, namely, the clinical and diagnostic side because I wish to press upon the attention of my ophthalmic colleagues the consideration of the matter of unilaterality in the degree of the optic neuritis when both discs are affected or of the meaning which is to be attached to a uniocular neuritis. This question is rendered even more important at the present time because some authorities state that no real value attaches to my suggestion. One, indeed, of our present text-books contains this sentence:—"No help in the localisation of the tumour can be got from a knowledge as to which eye failed in visual acuity first."

To this I would reply that, within my own knowledge, the early failure of visual acuity indicates beyond doubt the situation of the tumour. For instance, in every case on which I have operated at the National Hospital, since the recent discussion in the Ophthalmological Society, the neuritis was more marked or was older on the side of the lesion.

* For abstract see THE OPHTHALMOSCOPE, August, 1908, p. 620.

We may now take up this point in detail in respect of diagnosis. It is in the first place a question of considerable interest how far the determination of the locality, that is the position on the optic disc, of the commencement of the optic neuritis may be made to contribute to this question. I have seen less than the upper and the inner quadrant of one field becoming the starting point of neuritis from the presence of a small tumour. Sir William Gowers, of course, long ago pointed out that the whole of the inner half of the disc was the seat of the beginning of neuritis in the majority of cases, and, finally, Mr. R. M. Gunn has proved that in a large number of cases the lower part of the disc is very prone to be affected. Be this as it may, it is quite clear that the neuritic process involves in its acute form the nasal side of the disc first, and, consequently, I would suggest, that if secondary degenerative changes can be found in that part of the disc on one side the whole process must have commenced in that disc, and arguing according to my rule, that would immediately indicate this side of the disease.

The mention of degenerative changes in the disc introduces us to the all-important question of the age of the neuritis. I would urge, as before, that the degree of neuritis is not merely a question of the height of the two discs, because, as will be seen directly, difference in swelling does not necessarily mean that the more swollen disc corresponded to the side of disease.

The essential point throughout, I venture to think, is the estimation of the age of the neuritis, and that means minute examination (by the direct method, of course) of the interstitial tissue of the disc.

We may start, for instance, finding a disc in that condition which Mr. R. Marcus Gunn first spoke of as "juicy"—that is to say, in which the swelling of the disc appears so uniform and so translucent as to justify Mr. Gunn's strikingly descriptive term.

From this stage we pass through every gradation of the changes which are spoken of as "striation," "stippling," "dotting," "formation of white spots," and "shrinkage," until the atrophic condition is arrived at.

A good example of the bearing of the age of such changes is a case published by Sir William Gowers in the *Clinical Journal* thirteen years ago, as is well shown by the beautiful drawings made by Dr. Ridley. The case was one of my own, namely, a large lesion in the left occipital lobe.

As will be seen from the drawings, the disc on the left side, that is the one on the homolateral side, was subsiding into atrophy, whereas on the opposite the disc was greatly swollen. These drawings prove the importance of observing closely the condition of the disc and illustrate the fact that if the neuritis begin first on the side of the tumour it necessarily degenerates first. Hence, when one sees, as in this instance, marked signs of atrophy of

one disc, with more swelling of the opposite side, we ought to appreciate the meaning of that essential correspondence between the neuritis and the region of the disease.

In thus speaking of uniocular neuritis I would also indeed include those of the specific kind which ordinary mercurial and other drug treatment, iodides, etc., is expected to cure. To my mind, on the contrary, early operation should be resorted to in such cases, in order that the inevitable injury changes in the nerve should never be allowed to begin, for once established the damage is irretrievable.

The question of the possibility of dealing with atrophic changes must now be considered.

It is in the first place certain that nothing can be done for cases which exhibit well-marked atrophy, and only bare perception of light. But there are all sorts and degrees of atrophic changes which may be present and which ultimately disappear with good results as regards vision if the source of the neuritis be removed.

Of these, the most striking example is the chronic form of optic neuritis met with in very slow-growing cerebellar tumours.

Although I have not myself had that special experience to enable differentiation between two kinds of tumours that was first indicated by Mr. Sydney Stephenson, I am nevertheless quite sure that this chronic form of neuritis to which I am now referring is readily distinguishable from the subsiding atrophy of a previously highly-swollen condition in neuritis accompanying a rapidly-growing sarcoma of the cerebral hemispheres. The photograph shown was published in the *British Medical Journal* two years ago, but I venture to show it again as the opportunity of seeing the condition of the disc in which neuritis has been known to exist for thirteen years must come but rarely. In this instance the *data* are absolutely established, since it was Mr. Priestley Smith (whose enforced absence we regret to-day), who first discovered that the patient was suffering from neuritis.

The atrophic condition caused by post-chiasmatic tumours is a further case in point, although due in a great measure to the direct strangulation of the optic tracts by the stretched carotid arteries. Naturally, the degree of atrophy expresses precisely the limits of possibility of relief by operation, and therefore we ought to group and to classify in as minute detail as possible all varieties of atrophic change arranged according to their exciting causes.

I feel, in conclusion, that the question of the saving of sight, even to people who must inevitably die of a fatal disease, is so all-important that a general statement of the points should be drawn up so as to include all classes of cases—those in whom it is possible to remove tumours and to get them well; those who have meningitis and recover; and even those who are suffering from malignant disease and ultimately succumb.

Such a **summary** of the position should be, I think, as follows:—

1. That all cases of optic neuritis should be relieved as soon as possible by operative treatment.

2. That such operative treatment, in the absence of other indications, should be opening of the subdural space in the temporal or subtentorial region.

3. That the physician or surgeon in charge of a case must be held to be responsible for consequent blindness if the neuritis be not treated as soon as detected.

DEVELOPMENTAL DEFORMITIES OF THE CRYSTALLINE LENS.**

(Concluded).

BY

E. TREACHER COLLINS, F.R.C.S.,

SURGEON TO THE ROYAL LONDON OPHTHALMIC HOSPITAL (MOORFIELDS), ETC.

The fibro-cellular tissue at the back of the lens passes through the gap in the capsule invading the lens substance, and extends almost to the centre of it. Small collections of lens substance are seen in the sections surrounded by fibro-cellular tissue. In part of the fibro-cellular tissue within the lens capsule are some collections of red blood corpuscles.

At the anterior pole of the lens is a mass of laminated tissue presenting the appearance of an anterior polar cataract in which the fibres has become less closely compressed than usual. The lens substance is composed of a network of hyaline material with empty spaces in it.

In this case there is met with within the lens capsule an admixture of lens substance of epiblastic origin and atypically developed vitreous of mesoblastic origin. In the next case I shall refer to, the invasion of the lens substance by the mesoblastic tissue has been even more extensive than in the last.

It was a congenitally malformed cystic eye in which there had apparently been a failure of involution of the primary into the secondary optic vesicle.* The lens showed extensive changes, its anterior capsule was thrown into numerous folds, and lining it were epithelial cells in some places many layers thick. No well developed lens fibres could be detected. There was a considerable gap in the posterior capsule through which atypically developed vitreous, containing blood vessels, extended forwards. The contents of the lens capsule had thus become a vascularized

**An address read before the Oxford Ophthalmological Congress, *July 17th*, 1908.

Trans. Ophth. Soc. of the U.K., Vol. XXVI, p. 177.

mass of cellular tissue, in which it was difficult to differentiate the mesoblastic and epiblastic elements; granules of calcareous material, staining deeply with logwood, were scattered about in it.

These cases with a congenital defect in the posterior capsule of the lens and with fibro-cellular atypical vitreous filling the gap or extending forwards into the lens substance, are not only of considerable pathological and embryological interest, but also of clinical importance.

In the first case I have mentioned, although clinically a grey reflex was seen at the back of the lens, the lens itself appeared clear. Except for some cortical opacities, the same was true of the second case. Microscopical examination of the lenses in both these cases, however, showed extensive changes, which could not be entirely accounted for by the hardening reagents. Both these eyes were removed very early in life, at 9 months and 10 weeks respectively. I think there can be little doubt that if they had been left some months longer the whole lens in each case would have become opaque.

I have recorded a case* in which presumably there was a similar condition behind the lens where such a change was observed to take place.

The case was that of a child, four years old when first seen, in whose right eye the mother first noticed a peculiar appearance three weeks after birth. On examination a greyish-white opacity, with a somewhat metallic lustre, was seen behind the lens; in its centre was a small, dark, round, slightly depressed spot with fine blood-vessels passing through it. The lens itself was quite clear, and a red reflex could be obtained round the extreme margin of the opacity in all directions. Four months later the whole lens had become of a milk-white colour, and the changes previously seen at the posterior pole were hidden from view. The eyeball was enucleated and opened in the fresh state. The lens substance, which was milky-white throughout, easily separated from the capsule, at the posterior part of which was a dense white membrane. Passing right through the centre of the vitreous from the optic disc to this white membrane was a thin grey band. Microsopical examination showed the membrane to be composed of a dense mass of fibres and elongated cells, with a few small blood-vessels in it containing red-blood corpuscles. The central parts of the eye with the central hyaloid artery were preserved as a macroscopical specimen, so it cannot be definitely said whether or not there was a central deficiency in the posterior capsule of the lens.

In these cases, if the lens substance in front of the atypically developed vitreous became opaque before birth, or if the patient was not presented for examination until it had become opaque, the condition would be diagnosed as one of complete congenital cataract.

**Royal London Ophthal. Hospital Reports*, Vol. XIII, p. 365.

If a discission operation was performed some lens matter might be liberated, exposed to the action of the aqueous, and become absorbed ; but the fibro-cellular tissue at the back would be unaffected by the operation, and would remain as a dense opaque membrane, which it would be found very difficult to tear or to cut with a needle. If its removal was attempted by traction with a pair of forceps, vitreous would be certainly drawn forwards with it, and some would probably escape, seeing that the membrane is attached to, and is really part of, the vitreous. If it were to be incised with a pair of iridotomy scissors the gap formed would remain as a simple linear incision, and show no tendency to gape, the membrane being such a tough and inelastic structure.

All those who have had experience of operative procedures on congenital cataracts will recognise in the above, happenings with which they are familiar.

In two cases, shown to me by my friend, Mr. G. W. Thompson, where a tough membrane which could not be torn with a needle was encountered in connection with congenital cataract, the opaque tissue had ultimately been displaced downwards out of the central part of the pupillary area. A good clear opening in the line of vision had been thus obtained, through which the patient could see, and through which a clear ophthalmoscopic view of the fundus could be obtained. In both these cases a slender fibrous cord was detected passing forwards through the vitreous, from the centre of the optic disc to the back of the displaced opaque membrane, evidently the remains of a central hyaloid artery.

These two cases afford confirmatory evidence that the tough resistant membranes met with in congenital cataracts are frequently due to a malformation of the anterior part of the vitreous. They also, I think, serve to indicate the way in which such cases had best be dealt with. In them a very satisfactory operative result had been obtained by the somewhat accidental displacement downwards of the opaque tissue. I would advocate that such displacement or couching of the tough membrane should be deliberately carried out I think in most cases of congenital cataract it is first desirable to perform a needling in the usual way : it serves as an exploratory procedure enabling the operator to judge of the consistency of the tissue with which he has to deal ; it exposes to the solvent action of the aqueous humour whatever lens matter there may be present. If, as the result of the preliminary needling operation it is found that there is a tough resistant substance in the pupillary area, which is not an anterior polar cataract, then as a subsequent procedure I would suggest that the operation for its displacement should be performed.

In some of the cases I have mentioned with a congenital gap in the posterior capsule of the lens, there has been an extension forwards of mesoblastic fibro-cellular tissue into the lens.

I now come to a class of cases in which through a gap in the posterior capsule of the lens there was a protrusion backwards of the lens substance into the vitreous ; a class of cases which is known as posterior lenticonus.

For our knowledge of the anatomical changes in posterior lenticonus we are largely indebted to Carl Hess. An excellent little monograph, recording some fresh cases and summarizing the literature of the subject, was published by André Patry.*

There are, he says, 16 published cases of posterior lenticonus, in which an anatomical examination has been made, two in man, and the other 14 in rabbits and pigs. In five of the cases the condition was bilateral.

In 14 specimens a gap in the posterior capsule was met with, in some it was doubtful whether it was intact or not. In three the continuity of the posterior capsule was certain, but in these cases it was abnormally thin.

In those cases with a gap in the capsule, the lens substance was either in direct contact with the vitreous, or separated from it by a connective tissue membrane of variable thickness continuous with the canal of Cloquet.

In some of the cases the only changes in the lens itself were in the fibres projecting backwards into the vitreous, or in those in their immediate neighbourhood. In others the changes were more extensive ; the anterior cortical substance was involved in 10 specimens. In 8 specimens the nucleus was situated near the posterior pole, in some in contact with the posterior capsule.

The views put forward as to the cause of posterior lenticonus are classed by Patry under two headings :—

1. That the rupture of the posterior capsule (as he terms it) is due to an increased size of the lens.

2. That the rupture and deformity of the lens are both due to traction produced by the hyaloid artery.

With regard to the first theory, there is nothing to show why the lens should increase in size or why the posterior pole of the capsule should be the part to give. The increase in size of the lens cannot be attributed to the formation of a cataract, for, as already stated, in some cases the cataractous changes are entirely limited to the parts at the posterior pole protruding into the vitreous. It is difficult to accept Pergens' suggestion of primary new growth of lens substance, or "*phakome*," unaccompanied by any histological changes.

With regard to the second theory, there is the difficulty that in a large proportion of the cases no trace of a hyaloid artery was found. Indeed, in only 6 out of 21 specimens was it present. Moreover, the opacities of the lens met with in connection with lenticonus are some of them different from those met with in traumatic cataract, and are not always entirely localized at the posterior pole.

* *Sur l'Histologie et l'Étiologie du Lenticône Postérieur*, Genève, 1906.

Through the kindness of my friend, Mr. S. Mayou, I have had the opportunity of examining the sections of two microphthalmic eyes showing posterior lenticonus. Both cases have been recorded by him in the *Transactions of the Ophthalmological Society*.*

In the first case, the eye was an exceedingly malformed one, with a cystic formation apparently due to a distension of the anterior part of the primary vesicle.

The anterior capsule of the lens was lined in the usual way by a single layer of epithelial cells. The posterior capsule was absent, and was replaced by connective tissue, at the junction of which, with the capsule, the latter was thrown into numerous folds. In sections passing through the centre of the lens, I found a knob-like projection of the lens substance backwards through the opening in the capsule. Where the lens substance lay outside the capsule it was in contact with the connective tissue in the anterior part of the vitreous.

This case presented at the back of the lens a gap in the capsule and fibro-cellular tissue, as in the one I have first described, but instead of the fibro-cellular tissue extending into the lens substance, the lens substance extended out into it.

Mayou's other case was a microphthalmic eye with a congenitally detached retina, apparently due to failure in development of the vitreous humour. The lens had a conical projection posteriorly; its posterior capsule was intact, but appeared thinner than usual. There was some distortion of the posterior fibres of the lens, but no backward displacement of the nucleus and no posterior vascular capsule.

Neither of the two theories already referred to adequately explains the causation of posterior lenticonus when all the recorded cases are considered together, and I would suggest that a better explanation is to be found in regarding the gap in the posterior capsule as a defect in development rather than a rupture. The fact that Hess† has found and pictured the condition in a chicken embryo 150 hours old is, I think, strongly in support of this view. As I have pointed out, the development of the capsule at the posterior pole has to be completed exceedingly early, and should it fail to form there is no means in later life by which the defect can be made good.

The gradual growth of the lens would cause such a gap to expand, and if not too much blocked up by fibrous tissue formation in the anterior part of the vitreous, the lens fibres at the posterior pole would protrude through it, forming the conical projections which are met with.

In some cases the faulty development appears not to result in a complete absence of the capsule at the posterior pole, only

* Vol. XXIV, p. 340 and Vol. XXVIII.

†Pathologie und Therapie des Lensensystems, *Handbuch der gesamten Augenheilkunde*, Bd. VI, S. 201.

producing an undue thinness and weakness, which on growth of the lens results in a bulging outwards in that region.

Of the backward displacement of the nucleus of the lens which is met with in these cases of posterior lenticonus I shall have more to say later on.

The points which I have endeavoured to bring out in the foregoing observations as to the development of the lens capsule may be summarized as follows:

(i) That the lens capsule is the product of the epithelial cells lining it.

(ii) That the time during which the posterior capsule of the lens has to complete its development is exceedingly short, as the cells forming the posterior layer of the lens vesicle soon lengthen out into lens fibres and become separated from the capsule.

(iii) That congenital gaps in the posterior capsule are met with which are bridged across by fibrous tissue formation in the anterior part of the vitreous.

(iv) That this fibrous tissue formation in the vitreous, which sometimes contains blood-vessels from the central hyaloid artery, may extend through the gap in the posterior capsule, an admixture of mesoblastic and epiblastic tissue within the lens capsule resulting.

(v) That this fibrous tissue formation at the back of, or within, the lens capsule, accounts for those cases of exceedingly tough, shrunken, congenital cataracts which show little tendency to absorb after discission.

(vi) That the protrusion of lens substance through a congenital gap in the posterior capsule, or the bulging of a congenitally thin posterior capsule, offers the best explanation of cases of congenital posterior lenticonus.

2. Passing now to defects occurring during the second of the three stages into which I split up the development of the lens, that in which the nuclear fibres are formed from the cells lining the posterior part of the lens vesicle.

Before the lens vesicle has become completely closed anteriorly the cells which come to form its posterior layer show signs of elongation. After the vesicle is complete this elongation progresses until its whole cavity is filled by these cells transformed into lens fibres. These lens fibres later become surrounded by others laid on at the sides and form the nucleus of the lens.

If the cells forming the posterior layer of the lens vesicle for some reason failed to lengthen out into lens fibres, then no nucleus of the lens would be formed, and the laterally developed lens fibres would have nothing to encircle.

I wish to point out that there is a form of congenital cataract in which the pathological appearances are best explained by considering such an arrest of development in the nucleus to have taken place.

The clinical appearances of these cataracts are, I think, such as allow of them being differentiated from other forms of congenital cataract, and the recognition of their nature is of some practical utility in their treatment by operative measures.

The condition is one which has been spoken of as disc-shaped cataract, and four cases have been published in which anatomical examinations have been made. The first by Becker* in 1882, one by Vossius† in 1893, one by myself‡ in 1898, and the other by Hess§ in 1905.

The appearances of the lenses in anterio-posterior section have been figured in the three last. A comparison of the three figures and the descriptions given show that they presented the same chief characteristics. These are as follows:—flattening of the lens anterio-posteriorly, most in the centre; so that in a section two rounded masses are seen connected by a band, an appearance comparable to that of a dumb-bell. In the central flattest part of the lens a laminated mass of tissue is situated, similar to that met with in anterior polar cataracts. It extends backwards from the anterior to the posterior capsule, no lens substance intervening. In the rounded parts, at either side of the central laminated mass, there is lens substance, showing a variable amount of disturbance in the vicinity of the central part, and becoming more normal and regular in its arrangement towards the periphery.

Evidently, in these lenses there is an entire absence of the nucleus. Its failure in development does not seem, however, to have checked the activity of the cells lining the anterior and lateral parts of the capsule. The laminated mass in the centre is, as I have said, precisely similar in appearance to the laminated masses met with at the anterior pole of the lens in anterior polar cataract. These, as I have shown in the early part of this paper, result from the proliferation of the cells lining the anterior capsule, as the outcome probably of a decrease of the intracapsular pressure in their vicinity. In these lenses, in which the nucleus fails to develop, there would likewise be an abnormally low intracapsular pressure in the neighbourhood of the anterior pole of the lens, and so the formation of a large anterior polar cataract is what might be expected.

The activity of the cells lining the sides of the capsule not being interfered with, a formation of the laterally developed lens fibres has taken place. These having no nucleus around which to group themselves, have formed accumulations at the sides of the anterior polar mass, with irregularities and vacuolations of varying distribution.

Zur Anat. d. Gesunden u. Kranken Linse., Wiesbaden, 1883.
†*Beit. z. Augenheil.*, Bd. IX.
‡*Trans. Ophth. Soc. of the U.K.*, XVIII, p. 124.
§*Hand. d. gesamten Augenheilk.*, Bd. VI, p. 145.

The specimen showing this condition, which I examined, was described by me in a paper dealing with the pathogenesis of anterior polar cataract, and quoted as an example of a congenital formation of that form of cataract. I had not at that time appreciated the significance of the flattened condition of the lens as evidence of the non-development of the nucleus.

The lens was met with in a congenitally buphthalmic eye which was removed from a girl aged seven years. The eye had been noted as larger than its fellow from birth, and there had never been any inflammatory symptoms noted in it. There was a congenital adhesion of a portion of the iris to the cornea, a little above the centre of the latter, which showed no scar formation or any sign of part inflammatory infiltration. The condition of the lens could not be made out clinically.

In Vossius' case there was a leucoma of the cornea which also prevented the clinical appearances of cataract being seen.

In Hess' case the patient was first seen when 10 months old and had an iridectomy performed. Both eyes were similarly affected. Clinically there was a dense white central opacity with radiatory streaks from it. Around this central opacity was a typical zonular opacity and outside that a zone of clear substance. The edge of the lens was seen in the coloboma.

I have seen several congenital cataracts clinically which I think there can be little doubt belonged to this class. In some the results of operation tended to confirm the diagnosis.

The appearances which seem to be characteristic of this condition are: the presence of a dense circular central white opacity which, while extending to the anterior capsule, is at a distinctly deeper level than that of the surface of the iris at the pupillary margin: some irregular greyer opacity in the immediate vicinity of the central white patch, in which the latter appears to be set. With an undilated pupil this central opacity may fill the whole of its area, and appear to be a much shrunken opaque lens. If, however, a sufficient dilatation of the pupil can be obtained, a peripheral clear area is discovered. If an iridectomy is performed the edge of the lens will become visible, but it will be seen not to present its normal rotundity, appearing too thin from before backwards.

When a discission operation is performed on these cataracts, with a little manœuvring the white central opaque part can be separated from the rest of the lens, and will then probably drop down in the lower part of the anterior chamber, where it may remain for an indefinite time, showing no tendency to become absorbed or to give rise to irritation. When the dense, white patch has been picked off in this way, a central black opening is left, as can be easily understood from a study of the anatomy of these cataracts. After discission a small amount of lens matter usually becomes liberated and absorbed, but comparatively only a very small amount to what is so affected in other cataracts.

In this class of congenital cataracts, most satisfactory results are to be produced by needling operations, especially if the nature of the condition which is being dealt with is recognised. One or two discissions usually suffice to allow of good vision.

In a child of 18 months, with this form of cataract, whom I operated on in January, 1906, I succeeded in each eye in tearing away the central dense white *plaque*, which appeared to have calcareous matter in it. In each eye it has fallen into the lower part of the anterior chamber and remained there since. After its separation a good central opening, through which a clear view of the fundus could be obtained, was left.

3. My third stage in the development of the lens is concerned with the formation of the laterally developed lens fibres which surround the nucleus.

In the last class of case dealt with, some dystrophic influence, acting on the lens vesicle exceedingly early in fœtal life, resulted in the failure in formation of the lens fibres which develop from the cells of the posterior layer of the vesicle, but had not prevented the next stage in the formation of the lens, *viz.*, the development of lens fibres laterally from the cells at the sides of the capsule.

It is easy to imagine the exact reverse of this taking place, *i.e.*, a normal, or comparatively normal, development of the lens fibres from cells forming the posterior layer of the vesicle, and the occurrence of some dystrophic influence later, interfering with the development of the laterally-formed lens fibres from cells at the sides of the capsule.

Such an occurrence, I would suggest, offers an adequate explanation for another variety of congenital cataract which is met with, also presenting distinctive clinical characteristics. It is that form of congenital cataract in which a small nucleus, comparatively well-formed, is found in a capsule distended with opaque milky fluid, which latter has resulted from the proliferative activity of the cells at the sides of the capsule instead of lens fibres.

I have examined sections of one such cataract, which occurred in a congenitally microphthalmic eye removed from a child two months old. The lens appeared completely opaque, and showed some dense white calcareous-looking granules anteriorly. There were several other congenital malformations in the eye, a nearly complete absence of the iris, a persistent pupillary membrane, and a persistent hyaloid artery. In sections the lens was seen to be much smaller than normal, and to present a very irregular outline. Its nucleus was the only part in which lens fibres were well formed, they were there concentrically arranged and free from vacuoles; in the cortical portions there was much irregularly hyaline substance. Cells lined the whole of the posterior as well as the anterior capsule. At the anterior pole the capsule was much corrugated, and on its inner

surface was some dense laminated tissue, with flattened cells and calcareous deposit between the laminæ, a condition like that of ordinary anterior polar cataract.

In this class also may be included the case with total congenital cataract, the microscopical appearances of which are recorded by Hess.* The condition was bilateral, and the child died when six months old of pneumonia, 28 days after the lens in one eye had been needled. Sections of the lens in the unoperated eye showed the whole of the cortex to be composed of a homogeneous material, except for a few well-formed fibres in contact with the capsule at its equator. The nucleus which was suspended in this homogeneous material was composed of concentrically arranged fibres presenting changes similar to those met with in zonular cataract. In its peripheral parts there were numerous, variously sized, vesicles, and in the centre small drops staining deeply with hæmatoxylin.

In this case, I would suggest that the fibres arising from the cells of the posterior layer of the lens vesicle and forming the nucleus developed in the normal way. Then came some dystrophic influence which, besides affecting the fibres already formed so as to bring about the vacuolation in them, checked the development of the fibres which should have been laid on laterally, causing instead the formation of the albuminous fluid.

Clinically this form of congenital cataract presents the appearances of a Morgagnian cataract of late life. It has a characteristic milky-white homogeneous colour, and sometimes shows chalk-white specks on the surface.

I have operated on several congenital cataracts of this description; when the capsule is pricked with a needle there is an escape of the milk-white fluid, often containing some flocculent particles, into the anterior chamber. In two cases in which I left the opaque fluid in the anterior chamber I found the needling operation followed in the course of 24 hours by increase of tension. I now always adopt the precaution of evacuating it after making an incision with a broad needle.

The lens fibres developed laterally are formed by the lengthening out, forwards and backwards, of cells derived from proliferation of those composing the anterior layer of the lens vesicle. They gradually come to encircle the nuclear fibres developed from the cells of the posterior layer of the lens vesicle, and so cut them off from contact with the lens capsule. The separation of the original nuclear lens fibres from the capsule gradually increases with the growth of the lens.

Some laterally formed lens fibres lengthen out most backwards and others most forwards, but in the normally developed lens the nucleus is situated equidistant from the anterior and posterior

* *Handbuch d. Gesamten Augenheilkunde*, Bd. VI, S. 151

capsule. Displacement backwards of the nucleus of the lens is sometimes met with as a congenital malformation, there being a partial or complete failure in the backward growth of the laterally developed lens fibres. Complete failure is sometimes due to adherence of the nucleus to the posterior capsule.

Patry, in his monograph on lenticonus posterior, in which he analyses the histological appearances in 16 recorded cases, says:

"The nucleus is often (8 cases) situated very near the posterior pole, sometimes in immediate contact with the posterior capsule. This position is most often in association with a rupture of the posterior capsule."

As I have already pointed out, where he speaks of rupture of the posterior capsule in connection with this condition, I should say failure of development.

I have had a case under my observation for some years of a congenital cataract in which the nucleus appears abnormally far back. When first seen, the child was four years old; her left eye had been noticed to turn in since the age of eight months. The right eye appeared in every way normal and the lens was clear. In the left eye there was a dense white opacity at the posterior pole of the lens, and in front of it, close to if not in contact with it, a less dense greyish opacity which apparently involved the whole nucleus. It had a well-defined margin, but was not perfectly circular, being roughly triangular in shape. All the cortical lens substance at the sides and front of the opaque nucleus was clear; the latter was evidently situated much closer to the posterior than the anterior surface of the lens.

Hess* has pictured the microscopical appearances of a lens from a rabbit's eye presenting a condition very similar to what was apparently present in the above case. In it a much altered nucleus is seen situated too far back in the lens and imperfectly separated from the posterior capsule; the cortical lens fibres at the front and sides were healthy.

Knies† has suggested as an explanation of the changes in some cases of congenital axial cataract which he met with, that adhesion of the nucleus to the anterior and posterior capsule had taken place, and that consequently it assumed a spindle-shaped formation on the expansion of the lens by the development of cortical fibres laterally.

Vossius‡ adopts the same explanation for a case of his in which there was in one eye a typical anterio-posterior fusiform opacity, and in the other an anterior polar opacity and a lamellar cataract with a filamentary opacity passing between the two.

There is a variety of congenital axial cataract, termed by

* *Handbuch d. gesamten Augenheilk.*, Bd. VI, S. 158.

† *Archiv f. Ophth.*, Bd. XXIII.

‡ *Beit. z. Augenheilk*, Bd. IX.

Gunn* "coralliform," for which it seems to me difficult to accept the explanation suggested by Knies for his cases. In this coralliform cataract tube-like opacities are seen to radiate forwards and outwards from the centre of the lens towards the capsule and to end in an ampulliform manner. In the absence of any histological proof of the nature of such opacities, I would suggest that they are probably situated in the lines of suture between the fibres.

The lines of suture between the ends of the lens fibres vary in their arrangement in different animals, and in the human lens the arrangements which are met with in different animals are met with at different levels in its substance.

In the most primitive form of lens, such as the globular lenses of some fishes, all the lens fibres extend from a central point at the anterior pole, to a central point at the posterior pole, and the suture passing antero-posterior is a single straight line.

The simplest divergence from this arrangement is for the ends of the lens fibres, instead of meeting at a point, to meet along a line; the line at the anterior pole being at right angles to that at the posterior. This permits of some shortening of the lens fibres, those which have to extend furthest anteriorly not having to extend so far posteriorly, and *vice versâ*.

A further modification effecting the same purpose is for the line of junction of the fibres to have a triradiate arrangement, the three arms of the triradiate figure at the anterior pole being situated in the reverse direction to those at the posterior.

A more elaborate arrangement still is the formation of a star-shaped figure, with primary and secondary radiations, along which the ends of the fibres come into contact.

The human lens in fœtal life is at first globular; the fibres which are developed from the posterior layer of the secondary vesicle, and which form the extreme nucleus in the adult lens, have their extremities all meeting anteriorly and posteriorly.

As new lens fibres are laid on at the sides, the lens alters in shape, the lateral diameter increases more than the antero-posterior. A different mode of meeting of the lens fibres at the surface is then met with. At birth the simple triradiate figure at the anterior and posterior pole is seen.

With the further growth of the lens and the formation of fresh cortical layers the simple triradiate suture becomes in them replaced by the more complicated star, which at the surface of the lens in the adult is seen to present primary and secondary radiations.

In sections of a human fœtal lens, or of the lens at birth, the lines of suture running antero-posteriorly between the laterally developed lens fibres can easily be seen. Where the hardening of the lens has been imperfectly carried out and the lens fibres

Trans. Ophth. Soc. of U.K., Vol. XV, p. 119.

have shrunk, some expansion of the lines of suture frequently takes place. In sections of the adult lens the lines of suture are not to be detected.

It is well known that both in congenital cataracts and in cataracts occurring in late life disturbance may take place at the surface of the lens in the lines of junction between the lens fibres, resulting in a superficial triradiate or star-shaped opacity. What I now suggest is, that disturbance in the lines of sutures, not only at the surface, but also in their course as they radiate forwards and outwards from the nucleus, accounts for lines of opacity in congenital cataracts which are seen to radiate in that direction.

The defects which I have described as arising during this third stage of development in the lens may be summarized as follows :—

(1) The formation of congenital Morgagnian cataract from failure in development of the lens fibres laid on laterally, and their replacement by opaque albuminous fluid.

(2) Congenital displacement backwards of the nucleus of the lens, associated with a defective growth backwards of laterally developed lens fibres

(3) Congenital fusiform axial cataract (of Knies and Vossius), due to adhesion of the nucleus of the lens to the anterior and posterior capsule, and defective growth forwards and backwards of the laterally developed lens fibres.

(4) Axial opacities radiating forwards and outwards from the nucleus, and located in the lines of sutures between the lens fibres laid on laterally, which run in that direction.

Conclusion.

In conclusion, I would, as the outcome of my clinical and anatomical studies, make the following suggestions concerning the treatment of congenital cataract:

(1) To wait until a child is 10 months old before operating. At an earlier age the cornea is so small and the anterior chamber so shallow that the necessary instrumentation cannot be so satisfactorily carried out as in a more fully developed eye. Moreover, the amount of aqueous humour is so small that it does not suffice for solution of the liberated lens substance.

(2) In some cases in which the pupil is small and does not dilate well with atropine, it is best to commence with an iridectomy.

(3) In nearly all cases it is well to begin with a needling. For valuable information can be obtained by its means as to the thickness of the capsule and consistency of the lens, even should it fail to liberate much lens matter to the action of the aqueous.

(4) If the cataract is a dense, white, anterior polar one, set in a ring of clear, or partially clear, lens substance and apparently flattened from before backwards, the so-called disc-shaped cataract, then an attempt should be made to separate the

central white opacity with a needle and let it fall into the anterior chamber. Two needles are sometimes required to effect this.

(5) If, on pricking the capsule, milky-white fluid escapes into the anterior chamber (congenital Morgagnian cataract), it is well at once to evacuate this fluid, for fear of increased tension ensuing.

(6) In some cases of congenital cataract, the whole lens and capsule can be removed in a most satisfactory way by forceps. Very often, however, such a procedure is followed by escape of vitreous. It is difficult to differentiate which cataracts can be safely dealt with in this manner. They generally seem to be complete cataracts with a tough capsule and lens matter of a gelatinous consistency.

(7) If after a needling and some absorption of liberated lens matter, a dense, tough, white, fibrous-looking membrane remains, there is probably some atypical development of the anterior part of the vitreous. Under such circumstances, an attempt had best be made forcibly to displace the membrane downwards and backwards out of the axis of vision.

CLINICAL AND THERAPEUTICAL MEMORANDA.

THYROID EXTRACT IN KERATITIS.*

BY

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My purpose in presenting this paper is to offer an additional method of therapy, which, although not new in general medicine, is the first that I have been able to find applied to the eye.

The following condensed histories are those of the first cases in which I used this method of treatment.

In November, 1905, a case of corneal inflammation, which was both deep and superficial, reported to my clinic at the Will's Eye Hospital. The patient, a young man of twenty-three years of age, was admitted to the house for treatment, and a careful general study as to the questions of auto-intoxication, syphilis, tuberculosis, and malaria, was made with absolutely negative results.

The usual treatment of atropine, hot stupes, dionine, cleansing washes, quinine, and alteratives was instituted. This treatment was continued until January 15th, 1906, at which time I found

*Read before the July (1908) meeting of the American Ophthalmological Society.

the patient decidedly worse, particularly the left eye, which was the one that was the later and the worse affected. The superficial layers of the cornea had become densely infiltrated, the deeper lymph channels filled with red blood, and the overlying epithelium thickened and vascularized; the infiltrate being so dense that the pupillary outline could not be distinguished.

At this time I had my colleague, Dr. Charles A. Oliver, see the case in consultation, and we decided to try thyroid extract, internally and externally, taking care to watch both the local and general effects of the drug.

Accordingly, all previous internal treatment was stopped, and thyroid extract in five grain tablets, three times daily, was substituted, five drops of a fifteen-grain strength solution being instilled into each conjunctival *cul-de-sac* at the same time. The primary effect of this treatment was a marked clearing of the cornea within the first four days.

This improvement steadily continued, until at the end of three months' time, the patient, who had been able only to count fingers, possessed a vision of two-thirds with the right eye and two-fifths with the left. There remained but one small spot of infiltrate situated at the lower pupillary margin of the right cornea; with slight general haze in the left. The patient was then transferred from the hospital to the dispensary department. I continued the thyroid extract for several months, when the corneæ became entirely clear; the ultimate vision having arisen to full acuity with the right eye, and to two-thirds with the left.

Coincident with this case, January, 1906, a boy of eleven years of age, with a typical interstitial keratitis of both eyes, was admitted to my dispensary clinic at the Wills' Eye Hospital. He was put on specific treatment, and kept under close observation for about two months, during which period no marked improvement could be observed. On March 12th, 1906, I admitted him to the hospital, substituting thyroid extract for the former general treatment, and continuing the local. With this change the corneæ cleared rapidly, the patient being discharged on May 25th, with but a slight temporary corneal haze, which eventually cleared, as I continued the thyroid extract for several months.

Subsequent to the treatment of these cases I have continued the employment of the thyroid extract in varying doses, being guided by the degree and character of the general and local reactions, with the result that I have seen similar cases, both in my own and other clinics, cured in less time, with less disturbance, and with infinitely better results than I had previously obtained from any other combination of methods.

In all of my cases it must be remembered that each selected one was carefully chosen, properly studied, and judiciously treated, just as I had formerly done with similar ones.

Remarks.

Whether the rapid betterment of these cases by the use of this method of treatment was a mere coincidence or not, it is impossible to state definitely at the present time, but I am strongly of the opinion that it was not, but that it was due to some specific action of the thyroid extract. Should we accept Sajous' theory of "internal secretions," as I feel we must, then the explanation of the rapid improvement becomes easy of solution in the correction of faulty metabolism in structures which need better lymph supply and a more rapid interchange of the contained nutrient and cleansing fluids.

From my experience, I would advocate a smaller dosage than I at first used, having found that from one to two grains, adminstered twice or three times daily, will give results equally as good as, if not better than, larger doses.

I would urge the early administration of the extract in small doses, even where other drugs are properly indicated, as giving the most beneficial results.

I have simply recorded my clinical experience with thyroid extract in order to bring it to the notice of the ophthalmologist, not only for discussion, but that the exposition of the plan may be an inducement for proper laboratory research in this interesting field of ocular therapy.

A CASE OF INCOMPLETE CONGENITAL OPHTHALMOPLEGIA EXTERNA: WITH REMARKS.*

BY

SYDNEY STEPHENSON.

LONDON, ENGLAND.

Introduction.—Instances of congenital defects in the ocular movements, although certainly not common, must be sufficiently familiar to every ophthalmic surgeon and neurologist. Any and every extrinsic muscle may be involved, and combinations of all sorts may occur. One or both eyes may be affected, usually the latter. The defect may be partial or complete. Congenital ptosis—which is, of course, an example of the condition—is the defect most frequently met with, and when present, produces so striking an alteration in the patient's appearance that it cannot be overlooked, even by the most inattentive observer. Defects in the mobility of the eyeball are often associated with congenital ptosis, as in the case to be immediately described. Next to the levator palpebræ superioris, the commonest muscle to be affected

* Patient shown on February 21, 1908, before the Society for the Study of Disease in Children, London.

is the external rectus, usually on both sides. Paralysis of other cranial nerves, particularly of the VII, may be associated with the defective mobility of the eye, as in cases reported by Heubner, Warrington, and others.

Congenital ptosis must be carefully differentiated from the ptosis that may occasionally be the direct consequence of injury at birth, by forceps or otherwise. Thus, Berger (*Arch. f. Augenheilkunde*, 1887) after a difficult forceps delivery (instrument slipped twice), observed paralysis of the levator palpebræ superioris and the superior rectus. Again, in Bruno Wolff's elaborate monograph on "Injuries to the Eyes of the Child during Labour" (translated by Dr. Rosa Ford in THE OPHTHALMOSCOPE, September, 1907, to February, 1908) no fewer than seventeen cases are quoted where paralysis of the extrinsic muscles of the eye were apparently due to injuries received during birth.

Case.—The facts of my own case are as follows :—

Israel Harovitz, a Jewish boy of 8 years, was brought to the Evelina Hospital on February 11th last by his father, who stated that the boy had never been able "to open his eyes," and that the condition tended to become worse towards nightfall. There was no family history of any similar defect.

Personal History. The child, born at term, was delivered by instruments, the scalp being wounded during the operation. When six weeks old he developed a rash in the so-called "diaper region." For the first two years of life the child ailed on and off, suffering from "wasting," diarrhœa, and so forth. There were never any "fits."

Family History. — There are two younger children, both believed to be strong and healthy, and neither known to have any abnormality of eyes or of sight. The father admits having suffered from "chicken-pox" on the penis when eighteen years of age—that is to say, before he had had sexual connexion. No account of secondary symptoms can be obtained. His knee-jerks are present. The mother, according to the husband, is a delicate woman, who complains of her sight but who has never worn glasses.

On admission.—A fairly well-nourished but rather dull-looking boy, with mask-like "adenoid" facies. His mental development, however, is average. In a medium light, the transverse diameter of the pupils measures 6 mm. They respond to light, directly and indirectly, although the reaction in the right is less than that in the left eye. Response to accommodation equal and normal. No corneal opacities; no Hirschberg vessels. There is incomplete but bilateral ptosis. The movements of both eyes are deficient in all directions. The greatest range is downwards, while the excursions outward, inward, and upward are less than 2 mm. in range. No squint, diplopia, or nystagmus. R.V. = 6/24 and No. 1 Jaeger. L.V. = 6/60 and No. 1 Jaeger. Refraction, estimated while the eyes were under the influence of atropine, was R.E. $\frac{+0{\cdot}25}{+2{\cdot}75\ 90^{\circ}} = 6/12$; L.E. $\frac{+1{\cdot}0}{+3{\cdot}75\ 90^{\circ}} = 6/24$. There is a slight and incomplete form of coloboma of the optic discs, more marked in the left than in the right eye.

No evidence of paralysis of the I, V, VII, VIII, IX, X, XI, or XII cranial nerves. Knee-jerks absent, even on reinforcement. On the other hand, the ankle-jerks appear to be present. No syphilitic stigmata in face or teeth. No scars can be found upon the scalp or face in token of instrumental delivery. There is no synkinesis between the jaw and the drooping upper eyelids.*

Remarks.—In the foregoing case, then, there is defective movement as regards the extrinsic muscles of both eyes supplied by the III, IV, and VI cranial nerves, and according to the

*For these notes I am indebted to Dr. J. Sidney Pearson, my clinical assistant in the ophthalmic department of the Evelina Hospital, London.

anamnesis, the condition has existed since birth. It is of some importance to observe that in this case the extrinsic muscles of the eyeball are alone involved, while the intrinsic muscles are intact. In point of fact, it is uncommon for the latter to participate in the defect, although that is rather different from asserting, as a recent writer on nervous disease has done, "that no evidence of an affection of the internal ocular muscles has ever been present" (*Paralysis and other Diseases of the Nervous System in Childhood and Early Life*, by James Taylor, 1905, p. 349). In point of fact, these patients are usually brought for advice at an early age, when the recognition of paralysis of accommodation is out-of-the-question, and even that of paralysis of the sphincter pupillæ is capable of fallacious interpretation. Besides that, a defect of the internal musculature of the eye is not always expressly excluded from the recorded case-histories, and in some it is possible that it did actually exist. A few years ago I brought under the notice of this Society (*Reports of the Society for the Study of Disease in Children*, Vol. II, 1902, p. 117), a case that proved the contrary. The patient, a girl of 6 years, presented, as a congenital defect, almost complete paralysis of the right oculo-motor nerve, both internal and external branches being affected. The dilated pupil, which measured 5 mm. transversely, had no action to light. It became smaller after the local application of physostigmin (eserin) and larger after homatropin. Accommodation was completely absent. It was, in other words, an instance of congenital and total ophthalmoplegia. Moreover, a case of congenital ophthalmoplegia interna has recently been published (*Klinische Monatsblätter für Augenheilkunde*, XLV, 1907, p. 391) by Georg Levinsohn, of Berlin. The patient, a man of 17 years, presented as a congenital defect, pupils (dilated almost *ad maximum*), which were motionless both to light and to convergence, so that the eyes looked much as if atropine had been dropped into them. The punctum proximum lay at 30 cm. from the right and at 25 cm. from the left eye. The pupils responded to the use of physostigmin. The movements of the eyes were good. So far as I know, Levinsohn's case of almost complete bilateral ophthalmoplegia interna is unique. We may conclude, then, that although ophthalmoplegia interna is distinctly rare as a congenital defect, yet it may occur not only associated with a defect in the extrinsic muscles of the eye but also as an isolated symptom.

The influence of heredity in the production of congenital ophthalmoplegia is often most marked. Sichel-Vignes (*Recueil d'Ophtalmologie*, 1889, p. 422) had ptosis and epicanthus in 12 or 13 persons belonging to four generations, namely, in a grandfather, in six of eleven children, in four or five grandchildren, and in one great grand-daughter. In Gourfein's remark-

able case (*Soc. d'Anatomie et de Phy. de Bordeaux*, May 18th, 1903) six members of the same family (paternal grandmother, father, and four of six children) were affected. In a case published by J. B. Lawford (*Trans. Ophthal. Society U.K.*, Vol. VIII, 1888, p. 262) a father and four of seven children suffered from a congenital defect of the ocular movements. In a case of my own, hitherto unpublished, a father and four of seven children all presented more or less complete ptosis, together with paralysis of most of the extrinsic muscles of both eyes. The intrinsic muscles, however, were not affected. Other cases have been published by Hirschberg, Dujardin, Schiler, Ayres, etc.

Consanguinity was noted by Donald Gunn (*Trans. Ophthal. Society U.K.*, Vol. XIII, p. 150) in two brothers affected with congenital ophthalmoplegia externa, whose parents were first cousins.

As regards the explanation of such cases as my own, there is no unanimity of opinion even among those well-qualified to judge.

The two chief theories of causation are: 1. muscular, and 2. nervous.

1. The advocates of the muscular theory claim that defects in movement are due to the absence, incomplete development, or defective insertion of the particular muscle or muscles involved. There is anatomical evidence in support of this view. The leading case (as the lawyers say) is perhaps that of Heuck (*Klinische Monatsblätter für Augenheilkunde*, 1879), who made an autopsy on the body of a man of 18 years. During life this individual had exhibited ptosis with absence of the upward and downward movement of the eyeballs, together with defective action of the internal and external recti. The levator palpebræ superioris was badly developed on the right side and absent from the left, thus accounting for the ptosis observed during life. The imperfect movements of elevation and depression were apparently due to an abnormal insertion of the superior and inferior recti muscles. Indeed, in Heuck's curious case every extrinsic muscle of the eyeball, with the single exception of the internal rectus, was inserted into an abnormal part of the sclerotic coat of the eyeball. Bifurcation of the affected muscle was seen by Dieffenbach and Behr; muscles were found to be united with one another or with neighbouring parts by Morgagni and Olbers and Wrisberg; and, finally, abnormal insertions of the muscle or muscles were noted by Rossi, Dieffenbach, Pflüger, and others. The faulty insertion view as a cause of defective ocular movements has been supported by N. Bishop Harman (*Trans. Ophthal. Society U.K.*, Vol. XXV, 1905, p. 281) on the ground that such insertions are present as a normal feature in the lower vertebrata. The muscular theory, in brief, is doubtless capable of explaining satisfactorily some of the cases where a single ocular muscle is congenitally paralysed.

2. The nervous theory of causation assumes that the defective movements of the eyeball are due to absence or functional inactivity of the nuclei of origin of the nerves which supply the affected muscles. This nuclear palsy, for that is what it amounts to, may presumably be due either to maldevelopment or to intra-uterine inflammation. In my patient it is tempting to speculate that the absent knee-jerk implies a latent syphilitic taint, which was responsible for a polio-encephalitis during fœtal life. This hypothesis (I employ the word advisedly) would, at all events, explain the state of the ocular muscles.

The evidence in favour of a nuclear origin of congenital ophthalmoplegia is partly observational and partly inferential. To take the former first, Wilbrand and Sänger (*Die Neurologie des Auges*, 1900, Vol. I, p. 87) found more or less complete fœtal aplasia, that is, imperfect development, in the III nerve nuclei on both sides in a man who was born with bilateral ptosis and who died at 47 years of age from phthisis pulmonalis. Inflammatory and degenerative changes were conspicuous by their absence. Again, Heubner (*Berlin Medical Society*, May, 1900) obtained a *post-mortem* examination on the body of a child, who during life had been affected with paralysis of both VI and VII nerves, together with incomplete paralysis of the left III nerve, and absence of the lacrymal secretion. The brain of this infant showed no changes, macroscopic or microscopic. The medulla was incompletely developed, and manifested an atrophy extending from the olivary body to the nuclei, the lesions being more pronounced on the left than the right side.

The inferential evidence in favour of the nervous origin of congenital defect of ocular movement is, to my mind, of a strong order. To begin with, there is the important observation, made by several writers, as Möbius, Fryer, Lawford, Werner, and Schapringer, namely, that although the internal recti have acted imperfectly or not at all in association with the external recti, yet little fault could be found with their action during convergence. It is obviously difficult to understand how this could be the case were the defective movement in reality due to absence or maldevelopment of the muscle in question. Secondly, in a case such as that reported in the present communication, it is not easy to believe that a paralysis affecting almost all the branches of three cranial nerves, the III, IV, and the VI, could be the outcome of malformation or absence of the six extrinsic muscles of the eyeball supplied by those three nerves. Thirdly, in some instances, at least, examination has shown that the muscles are normal. For example, elsewhere (*loco citato*, p. 120) I have reported the case of a girl, aged 16½ years, affected from birth with imperfect abduction of the eyeballs, especially as regards the right eye. There was a convergent strabismus of the right eye which measured 40 degrees on the perimeter. The external

rectus of the squinting eye was exposed, and found to have, so far as could be judged, a normal appearance and a natural attachment to the sclera. Similar were the findings in a second personal case of "congenital paralysis of the external recti muscles" in a girl of 12 years. Louis Werner (*Trans. Ophthal. Society U.K.*, Vol. XXIV, 1904, p. 305) operated upon a child of 12 years affected with defects of the extrinsic muscles supplied by the III nerve. He found that two of the muscles examined were normal, and he assumed fairly, as it seems to me, that the others were also normal. Werner believes that whatever the nature of the lesion, "it was probably not a muscular defect." The fact that in Levinsohn's case of congenital ophthalmoplegia physostigmin caused contraction of the pupil appears to show that the sphincter pupillæ was present and its nerve-endings were capable of stimulation by the drug, and a similar remark applies to the case of my own mentioned earlier in this communication. Then, there is the suggestive analogy with congenital palsy of other cranial nerves, as the facial, and, as said before, the two conditions may be associated in one and the same subject. Lastly, the concurrence of imbecility with these congenital defects of movement, noted by Gowers, Wilbrand and Sänger, Heubner, and Sachs, suggests a defect of development

Is there, then, no way of reconciling the two views outlined above? Is one necessarily destructive of the other? Is it not possible that the ocular muscles, deprived of their nervous supply, might fail to develop or having developed, might degenerate and ultimately come to be represented by "a few membranous bands," as in a case of congenital convergent strabismus reported by Baumgarten, or "an ill-developed muscle," as in Olbers' case of congenital conjugate deviation to the right or by a "thin, atrophic thread," as in Guende's case of congenital divergence? It must, nevertheless, be admitted that even this would hardly suffice to explain cases, such as those mentioned by Harles, Krause, Steinheim, Cazeaux, and others, where the ocular muscles appeared to be absent. At most, the failure of nervous supply could account for an ill-developed muscle or, possibly, for a muscle being badly inserted into the sclera, owing to inadequate length.

Conclusion.—On the evidence, I incline to attribute most cases of congenital ophthalmoplegia to an affection of the nuclear centres which govern the defective movements. This brings the cases into line with the so-called "congenital nuclear paralyses," such as are known to affect the V, the VII, and some other cranial nerves. Whether as Sachs has suggested (*A Treatise on the Nervous Diseases of Children*, second edition, 1905, p. 516), there exists a close clinical and anatomical relationship between such cases and those of hereditary progressive muscular atrophy, I will not take upon myself to say.

NOVELTIES.

AN OINTMENT DILUTER.

BY

CHARLES WRAY, F.R.C.S.,

LONDON, ENGLAND.

In out-patient work one of the commonest complaints is the untrustworthiness of ointments. Occasionally this is because of imperfect sterilization, but far more frequently in consequence of imperfect dosage. Ammoniated mercury ointment, one of the most useful ointments of the Pharmacopœia, may be required in strengths varying from 1 per cent. to 15 per cent. in the same patient, whilst in the case of chrysophanic acid, the strength needed, according to the acuteness of the disease in different situations, varies between a $\frac{1}{4}$ per cent. and 5 per cent. Obviously, then, the correct use of ointments calls for carefully graduated dosage, especially in view of the disastrous effects of one over-strong application of the latter

drug. In eye work, so far as local applications go, the urgency of varying dosage is less, but the principle is not negligible. When, however, it is thought desirable to administer mercury by inunction in patients with "bad mouths," or feeble resisting power, diluting becomes as important as in eczema and psoriasis. Broadly, there are two distinct classes of cases that call for an ointment diluter:

(a) When a drug has to be used by inunction, in which case the amount of dilution rests solely with the surgeon, as he alone is competent to decide the dosage.

(b) Chronic skin cases, such as eczema and psoriasis, in which the activity of the disease varies within very wide limits in different parts of the body. In this case it will be for the surgeon to indicate as nearly as he can the strengths each patch will tolerate, and the dosage may—or may not be—varied by the patient according to results.

Imagine the effect of applying 5 per cent. chrysophanic acid required by a very chronic patch of psoriasis to an acute patch on the sensitive skin of the forearm, face, or scalp. It may be objected that such an eventuality is scarcely possible, but the sole reason for referring to it is because such cases have actually come under one's observation.

The diluter—as illustrated on p. 684—was made at my suggestion by Messrs. Martindale, of New Cavendish Street, London, W. It consists of a hollow cylinder (open at both ends and marked off into equal parts, 1, 2, 3, 4, etc.) in which works an accurately fitting solid glass piston. To dilute an ointment with vaseline—to, say, one-fourth—insert the diluter into the ointment and draw up the piston until the ointment reaches the line marked 1. Then remove the instrument and clean the end on sterilised wool, and insert it into the vaseline, drawing up the piston until the mixture reaches 4; after which the contents are to be pushed out into the lid of the ointment pot and mixed well together by means of the glass piston. The stronger dilutions should be made first and the weaker ones last, on the principle of diluting what has already been diluted.

As regards lotions, they may be diluted in the same way by fixing on the distal end of the instrument a metal cap perforated in the centre, as illustrated in the diagram

A MODIFICATION OF AXENFELD'S RETRACTOR.

BY

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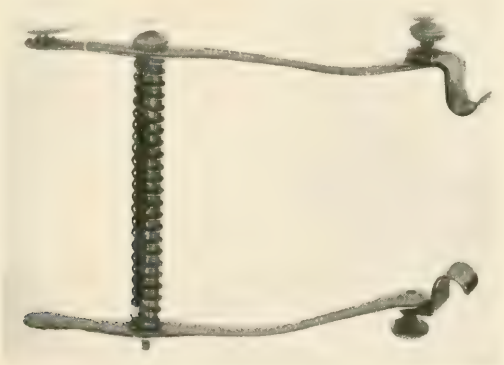
The sharp, fork-like blades of Axenfeld's retractor have always seemed to me to be very dangerous. Were one of them to slip,



out of the wound, the three prongs, impelled by a powerful spring, and perhaps fouled with pus, could conceivably be driven into the cornea. Such a wound would be attended with such lamentable results that I have got Messrs. Down Bros. to replace the original forks with smooth blades. The modified instrument, which is shown in the inset photograph, is quite as efficient as the original, and perfectly safe. Personally, I do not often use a retractor at all in the operation of extirpation of the lacrymal sac, for unless hæmorrhage is very troublesome, a suture passed through each lip of the wound sufficiently exposes the sac.

REVIEW.

SOME RECENT BRITISH WORK UPON STANDARDISATION.

By W. A. Dixey,
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Eight years ago the Optical Society appointed a committee to consider the question of standardisation in the optical trade as regards:—

(a) Standards of measurement,
(b) Details of construction,
(c) Nomenclature, and
(d) Any corporate subject.

Sub-committees were charged with the examination of the subject in its various details. Reports have been published, among them a Report of the "Spectacles and Eye-glasses Sub-Committee" in 1904.

Several questions arose out of this Report, *e.g.*, as to what methods of measurement should in some cases be adopted: limits of error had to be fixed; it was thought that standard gauges and templates should be generally available, and that an authority should be appointed which would be able to certify "standard" proficiency in any lenses, etc., that might be submitted to it. The National Physical Laboratory was approached and responded loyally to the call. A second, so-called "Trial Case Sub-Committee" was appointed, in which the nominees of the Optical Society were assisted by several officials of the Laboratory, and the work and decisions of this committee are summed up and formulated in another Report, which was published in June of this year.

Perhaps standardisation appeals in most respects to the optician rather than to the ophthalmic surgeon, but some of the

details dealt with in these reports touch the work of the surgeon very closely, and can hardly fail to be of interest to the readers of this Review.

The 1904 Report begins with some obvious recommendations; that the metric system be used for all linear measurements; that angular measurement be expressed by degrees; and that the dioptric system be the standard of measurement of spherical and cylindrical lenses. These are standards of notation that have already become nearly universal, although there are ophthalmic workers who still record their linear measurements in English and their lens measurements in Paris inches.

Incidentally, in the publication of this year's Report, the Optical Society has settled, so far as it is competent, the spelling of the word used for the unit of lens-power. This has hitherto appeared variously as "dioptre," "diopter," "dioptry," and "dioptrie." It is the first of these varieties that was adopted after debate; and, it would seem, wisely; as it is the spelling which corresponds with the common pronounciation of the word, although there are some eminent physicists, notably Professor Silvanus Thompson, who write and pronounce "dioptric."

The method of indicating the direction of axis of a cylindrical lens furnishes a case where a recognised standard would be distinctly advantageous. At the present time, especially in England, great variety prevails. This involves extra work for the surgeon in diagram drawing, and not infrequently doubt to the optician as to the interpretation of a roughly designed symbol or of some ambiguous words. The method advocated by the Optical Society is obviously the simplest, and, as it agrees with the recognised convention of angle measurement in mathematical practice, would seem to be the best on other grounds. The specification of the method in the Report is a little verbose, but it has the advantage of precision:—

"*Angle notation for cylindrical lenses.*—For the right eye the numeration to be from 0° at the nasal side, proceeding upward to 90° and then downward to 180° on the temporal side, restarting from that point as from 0° and proceeding downward for the second semi-circle. For the left eye the numeration to be from 0° at the temporal side proceeding similarly to 180° on the nasal side, restarting from that point as from 0° and proceeding downward for the second semi-circle."

It is obvious that when this system is adopted, a simple figure is all that is required to indicate the desired position of the axis, and the same figure corresponds with the same direction in either eye; another advantage is that in sight-testing instruments, such as the ophthalmometer, the same scale serves for the right as well as for the left eye.

Prism notation is another case where a standard convention would be acceptable. In their first Report the Committee "did

not feel able to offer any suggestion, so much diversity of opinion having been found to exist." But from this year's Report may be gathered, at least by implication, that the prism dioptre is recommended as the standard. In dealing with the conditions for measuring a prism the Report directs that "the power of a prism is to be measured by the minimum deviation produced by it, and this deviation is expressed by the number of centimeters of displacement produced in an object at one metre distance; the unit is called the prism dioptre." The symbol used to indicate the prism dioptre is the Greek capital Delta, Δ. This would seem to amount to a definite pronouncement.

That standard prism notation should be based on the deviating power rather than on the angle of inclination of the two sides is the right principle; but it would seem likely to lead to confusion of idea that the term dioptre, which is a term originally adopted to denote the quality of curvature, should be used for what is essentially a measurement of angle. The deviating power of a prism must always be estimated by measuring the apparent displacement of an object at a known distance; the construction of a tangent scale presents no difficulties; and there would appear to be no reason why the result of the measurement should not be directly recorded in degrees of the deviating angle. The prism dioptre recommended by the Optical Society may or may not be generally adopted; it has at least this in common with the degree notation, that it stands for a quantity capable of exact measurement, and its adoption will do only good in so far as it helps to rule out the indefinite notation based on the angle of inclination.

The 1904 Report details a number of "methods of measurement" for the several parts of spectacle and eyeglass frames which are, in the main, of use only to the spectacle maker. The size of the eyes, the "spread" of the bridge, the thickness of the wires, and so on, may generally be left to the discretion of the optician; but there are cases where the surgeon may wish to specify the shape of the eyes, and in such cases it is convenient that the term used to express the required shape should be one that is generally recognised. Under the heading of "Nomenclature" the Report denotes the shapes of spectacle eyes as: round, oval, long-oval, round-oval, pantoscopic, and half-oval. These names carry for the most part their own interpretation; "round-oval" is the shape which may be described as oval at the top and round at the bottom; and "pantoscopic," a term now not so much used as formerly, a similar form but shallower, *i.e.*, with its vertical proportionately less than its horizontal axis.

"Names of sides," too, may be noted. These are: straight, plain curl, twisted curl, half curl, and turn-pin. "Half curl" is presumably the stiff side, made of untempered steel and shaped round the ear, which is often used for children.

The earlier Report contained a suggested standard series for

neutral-tinted and coloured glasses, and the subject is dealt with more fully in the Report issued this year. The intensity of a ray of normal white light passing through a tinted glass is reduced in a certain proportion during transit. The scale of tinted glasses is therefore based upon the transmission values of the glass. The following table gives the standard transmission values, which are recommended :—

Optical Society's Standard Transmission Value.

No. 1	80 per cent.
„ 2	65 „
„ 3	50 „
„ 4	40 „
„ 5	30 „
„ 6	20 „
„ 7	10 „
„ 8	5 „

A set of standard neutral-tinted glasses has been provisionally selected, and their transmission values, under certain definite conditions, have been determined by the National Physical Laboratory ; the transmission values of other glasses can be obtained in terms of these standards to a high degree of accuracy.

Attached to an account of the work done in connection with tinted glasses, the Report contains two plotted curves, showing the percentage of transmission throughout the spectrum of a neutral-tinted and of a blue glass, each having a mean transmission value of 35 per cent. approximately. The curves are interesting, but of little practical value, until something more definite is known as to the relation to different parts of the spectrum of the therapeutic or deleterious properties of light.

One of the chief difficulties of the Committee has been in connection with the measurement of the power of spherical and cylindrical lenses. It was felt that the principle of neutralisation should not be sacrificed—that the lenses of a trial case should be so gauged that when a convex lens was put against its corresponding concave, the two should have the effect of a plain glass. For the low power lenses there is no difficulty ; but in the high power lenses, by reason of their thickness, the true power of the positive is lower than that of the negative, which it neutralises. Thus, the power of a lens which will neutralise a — 20·D is approximately + 19·D ; or to be precise (taking the index at 1·52, allowing a diameter of 38 mm. and an edge thickness of ·5 mm.) the neutralising lens is + 18·84 D. The difficulty is generally recognised, and variously dealt with by makers of trial cases, English, French and American. It seemed to demand a definite decision. The matter was discussed in October, 1907, at a meeting of manufacturers and others interested, and there was a great preponderance of opinion in

favour of the neutralisation basis. This view is embodied in the Report, and in accordance with it the following recommendations are made :—

1. That the neutralisation method of testing for power be accepted as the basis for the scheme of standardisation to be adopted.

2. That the true powers of the negative lenses be required to agree with the values marked on the lenses, or their mounts. The limits of error allowed to be ± 2 %, or ± 0·01 D. where this is greater than 2 %.

3. That the standard thicknesses and powers for the positive lenses be such that the positive lenses will neutralise the corresponding negatives. That the *nominal* values given to these standard powers be the same as those of the negatives they neutralise.

4. That the limits of error allowed from the aforesaid standard powers, in the case of positive lenses, of powers not less than 10 D., be + 2½ %, from 20 D. to 13 D. inclusive, and + 3 % from 12 D. to 10 D. inclusive, and − 1 % from 20 D. to 10 D. inclusive.

5. That for the powers of positive lenses of nominal value below 10 D., the limits of error allowed from the *nominal* values be ± 2 %, or ± 0·01 D. where this is greater than 2 %, as for the corresponding negatives.

6. That a statement, giving the true powers of the standard positives, be required to be pasted in each trial case sent for certification.

The rest of the Report has to do with the method of measuring the power of prisms, the centreing of spherical and cylindrical lenses, the marking of axes of cylindrical lenses and the base-apex line of prisms. An appendix contains some useful tables of the calculated powers of positive lenses to neutralise standard negatives for different values of the refractive index ; of the effect of thickness on the power of lenses ; and a table of the limits of error permitted in lenses which are sent to the National Physical Laboratory for certification.

Both Reports show evidence of much careful work and may be regarded as of considerable value. At any rate, they should make for more accurate work on the part of the optician. It should be useful also to the surgeon to know that a standard of terms and quantities exists which is universally capable of similar interpretation.

The later Report owes a great deal to the work done and the advice given by officials of the National Physical Laboratory. That Institution is now prepared to test and to certify trial lenses for power, for centreing and marking, or for tint That this arrangement has been made possible is perhaps not the least valuable result of the recent work of the Optical Society upon standardisation.

TRANSLATION.

BIFOCAL LENSES.*

BY
M. TSCHERNING,
OF PARIS, FRANCE.
Translated by J. JAMESON EVANS, F.R.C.S.

IT is well-known that Franklin, to avoid the annoyance of a frequent changing of glasses, invented the lenses which bear his name. He used the upper half for distance and the lower half for near; the two halves were held together by the frames only. About 1860, Moussier, an optician of Nantes, began to make bifocal lenses in one piece.

By the ordinary method of lens-grinding—rubbing them against a tool of opposite curvature—it was quite easy to grind, on a convex surface, a facet of lesser curvature but not one more curved. It was therefore necessary to take the glass for near vision and grind on its upper part a facet suitable for distant vision. This procedure had the serious drawback of restricting the visual fields for distance—just where an extended field is most desirable.

It was found necessary to keep the line of demarcation as low as the centre of the glass or lower, and this gave these glasses a curious appearance.

The next suggestion was to stick a small supplementary lens on the lower part of the distance glass. In order to render this invisible, Strubin, an optician of Bâle, scooped out a small concavity on the anterior surface of the lens (a meniscus) and inserted into it a small lens of flint glass. The curvature on the concave side was calculated so that the small lens should have the same external curvature as the bigger lens and thus the insertion became almost invisible. But this procedure had certain drawbacks. The flint glass is easily splintered, and if the presbyopia be very marked it is necessary either to take a very thick piece of flint glass or to make the inner curve very sharp; in both cases the chromatic aberration becomes appreciable. A further objection to it was that a blow might easily detach the small lens, but this has now been overcome by Borsch's new invention.† But the chief trouble with bifocal lenses is in regard to centreing.

Opticians are particular that the part of the lens in general use should not have a prismatic effect, not only because of the apparent displacement of the object viewed, but also because of the incidental astigmatism which generally results. The "centre" of the lens, or the part free from prismatic effect is

*From *Recueil d'Ophtalmologie*, mai, 1908.

†Borsch brings the two lenses just to fusion-point and thus obtains fusion without any change in the curvature of the lenses.—J. J. E.

found by observing a straight line long enough to be seen across the glass and on each side of it at the same time. The glass is moved about until a position is found in which the whole line is seen without a break. This line is marked on the lens with ink, and the procedure is repeated in a line at right angles to the first. The point of crossing of the two lines indicates the "centre."

In the case of the glasses of ordinary spectacles, the optician's task is very simple. The centre of the glass is generally placed in the middle of the oval. If the distance between the two centres is equal to the distance between the pupils, the glasses are centred. For bifocal lenses the problem becomes complicated. It is necessary that each part of the glass be "centred."

On the other hand, as it is important that the line of separation should not be placed in front of the pupil, it is necessary that the two centres be fixed at a distance, one from the other, which is at least equal to the diameter of the pupil, and that the line of demarcation be placed almost in the middle of the distance between the two. In that way the eye can use one or other centre without any inconvenience from the line of separation—at least, in direct vision. This result is not easy to attain. Take, for example, two + 3 trial lenses and place one against the other so that they partly overlap. We thus get a sort of bifocal lens, the upper uncovered part being used for distance, and the part where they overlap, for near. But they are not well-centred. In fact, the centre of the strong part is situated on the line which joins the two intersections of the circumferences of the two lenses, so that the distance between the two centres would be too great. If the two glasses are not of the same strength, the centre becomes deviated towards the stronger—often close to one or other of the edges of the facet or sometimes even outside of that. Sometimes, we can remedy the defect by diminishing the diameter of the facet, but we cannot go far in this direction without seriously diminishing the field. The problem has been solved by means of an invention* of Sutcliffe, an English optician. This invention has produced a small revolution in the optical world. For four or five centuries, during which spectacle glasses have been made, no practical means of grinding optical surfaces has been found other than the rubbing of the glass against a basin presenting a curve opposite to that which is required. Sutcliffe's procedure is quite different. Without entering into the details of manufacture, an idea of the principle may be given as follows:—

The circle A. B. (Fig. 1) represents a piece of glass whose

* Sutcliffe's method of making downcurve bifocals consists in grinding a small area—previously defined by a groove cut by a tube—on the lower part of the lens. The grinding tool is of the usual type and the lens and holder are fixed. The process here described by Tscherning is essentially that patented by Bentzon & Emerson, of London, in 1904.—J. J. E.

surface we wish to grind. It is placed horizontally and turns round a vertical axis, passing through C. The small circle A. C. represents the lower end of a small tube placed vertically so that it rubs on the glass. It turns round its own axis at the same speed and in the same direction as the glass. It is, moreover, suspended freely, so that it can take any position. It is easy to see that the tube does not produce any wear of the glass at A, since they both turn at the same speed and in the same direction. In the neighbourhood of C., on the contrary, the tube will wear down the glass, as the direction of its movement is, in this region, opposite to that of the glass. The latter will therefore become scooped out towards the centre, and the tube, vertical at first, will become inclined more and more towards the centre of the glass. To obtain a convex surface the tube must be rotated in a direction opposite to that of the glass. Surprising as it may seem, we get by these means perfectly spherical surfaces ; the curvature depends on the relative speed of the two movements. This is the method

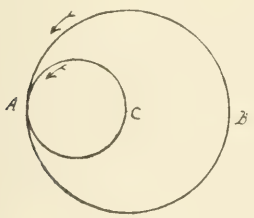


FIG. 1.

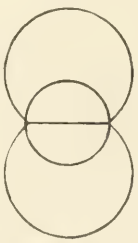


FIG. 2.

FIG. 3.

employed by the U.B.F. (Unibifocal) Society of London, for their bifocal glasses. The lenses are always made in pairs. Two ordinary lenses are taken, and, a segment of each having been removed, they are placed side by side as in Fig. 2. The small surface is then worked by Sutcliffe's method.* But if, in order to work the facet, the two lenses are placed on one plane, the defect of centreing already mentioned will result. To avoid this, the two glasses are placed on a sort of prismatic block so that they form an angle, previously determined, and which varies for each combination (Fig. 3). The small surface is then ground in the direction A. B. The defect of centreing is in this way perfectly corrected. It is as if a small prism, with its base directed towards the centre, had been interposed between the large glass and the small supplementary glass.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—HEAT-RAYS AND HYPERMETROPIA.

Armbruster.—On the action of heat-rays upon the hypermetropic eye. (De l'action des radiations calorifiques sur l'œil hypermétrope.) *La Clinique Ophtalmologique*, 10 mai, 1908.

It has been shown by Féré, Widmark, Finsen, and others, that heat-rays stimulate nutritive changes in the tissues and the surface circulation, and are tonic and stimulant to the nervous system, while chemical rays can, when locally applied, cause the disappearance of hyperæmia, and have a soothing and analgesic action.

Armbruster (Troyes) has tried the effect of heat-rays in raising the visual acuity of eyes with amblyopia *ex anopsia*. The results have been encouraging and seem to be permanent, acuity rising, as a rule, after two or three sittings from $\frac{1}{4}$ and $\frac{1}{3}$ to $\frac{1}{2}$ and $\frac{2}{3}$, and occasionally to 1. The author states that in high hypermetropia and in astigmatism he has never been able to get the patients to read all the letters corresponding to V.A.=1. The influence of the wearing or not wearing of glasses has been carefully watched, and Armbruster is convinced that his results are quite exclusive of the influence of the correction. The paper is quite short but as far as it goes, is distinctly interesting. The author's method of using the flame of a petroleum lamp combined with a red glass seems primitive and may perhaps be improved upon.

ERNEST THOMSON.

II.—THE USE OF CYCLOPLEGICS IN REFRACTION WORK.

Duane, Alexander.—When and how shall we use cycloplegics in refraction work? *New York State Journal of Medicine*, July, 1908.

Duane's article deals with questions of first importance, and should be read and pondered by every ophthalmic surgeon. His remarks are based partly on an experience of twenty-one years with cycloplegics and partly on an examination of some 250 patients recently undertaken in conjunction with J. B. Thomas. As regards the latter, the manifest correction was ascertained

before the use of a cycloplegic, as well as the range of accommodation possessed by the patient under these circumstances. Homatropin was then dropped into the eyes every ten or fifteen minutes, the range of accommodation and the width and reaction of the pupils being determined at frequent intervals, until such time as the maximum degree of cycloplegia was secured. Refraction was then determined subjectively and by skiascopy. Results were carefully tabulated.

The various points taken up by Duane may be dealt with as follows :—

Can refraction be precisely estimated without a cycloplegic?—To this question Duane returns an unequivocal negative. In his experience, the measures relied upon to unmask a latent error of refraction (without a cycloplegic) often proved themselves to be ineffectual. Furthermore, Duane could rarely judge in a given case whether they were or were not ineffectual. Incidentally, the author denies the supposed connection between esophoria, on the one hand, and latent hyperopia, on the other. The presence of esophoria may arouse a suspicion that there is also a latent hyperopia, but Duane believes, as the result of careful measurements, that no quantitative relation exists between the two conditions.

Is an approximate correction of refraction adequate to most cases?—Duane does not deny that it is usually possible, without using a cycloplegic, to form an approximate idea as to the direction and amount of astigmatism, provided the latter be considerable. But when it comes to estimating astigmatism to within 0·50 D. or 0·25 D., and especially when it is a question of low degrees of astigmatism, Duane finds a cycloplegic indispensable. Most ophthalmic surgeons are agreed that in many cases patients will not be benefited unless any astigmatism is estimated and corrected to within 0·50 D. or 0·25 D. In such cases it is obvious that "the often approximate and nearly always uncertain correction that we get without a cyclopegic will not answer." Without a cycloplegic, we may fail to discover that the amount of hyperopia differs in the two eyes. Again, if astigmatism and manifest hyperopia alone be corrected, we shall in many cases fail to relieve the patient's symptoms. Lastly, there is the important fact that the proper use of a cycloplegic adds much to the accuracy of the skiascopic examination.

At what age is the use of a cycloplegic necessary?—Duane holds that it is even more necessary to use a cycloplegic in adults than in children, and particularly to employ such an agent at and after the age of 40 years.

Is homatropin a safe and a satisfactory cycloplegic?—The view that homatropin is a dangerous remedy—a favourite and convenient bogey with the enterprising "optologist"—has, practically speaking, no foundation in fact. Homatropin, like

any other agent capable of dilating the pupil, may "once in a great while" cause glaucoma in a predisposed eye. Duane has never seen such a result, although he has used homatropin in thousands of cases. He quotes D. W. Greene (*Ophthalmology*, January, 1908, p. 278), as having applied the drug to 910 eyes in men over 60 years of age, without ever having experienced such a complication. Delirium in children, a rare event, is probably due to contamination with atropine. In most cases the findings with homatropin are "satisfactory, certain, and represent a full relaxation of the accommodation." The rule is that homatropin, if used in a proper way, is a satisfactory cycloplegic.

What is the best way of using homatropin?—A 2 per cent. solution is recommended, and of this liquid Duane usually makes five applications to the eyes at intervals of not less than six minutes and not more than fifteen minutes. Complete cycloplegia can scarcely be expected in less than one hour after the first instillation. There are, however, individual variations in this respect. Hence, before testing with lenses, it is important to determine the patient's near and far points. Duane rightly insists that there is no necessary relationship between mydriasis and cycloplegia. Most persons are able to read within thirty-six hours after homatropin has been applied to their eyes. Accommodation may return at an unequal rate in the two eyes. Anyhow, patients should be cautioned against employing their eyes for any near work of a trying kind for three days after homatropin has been used.

SYDNEY STEPHENSON.

III.—SUBCONJUNCTIVAL EXTRACTION OF CATARACT.

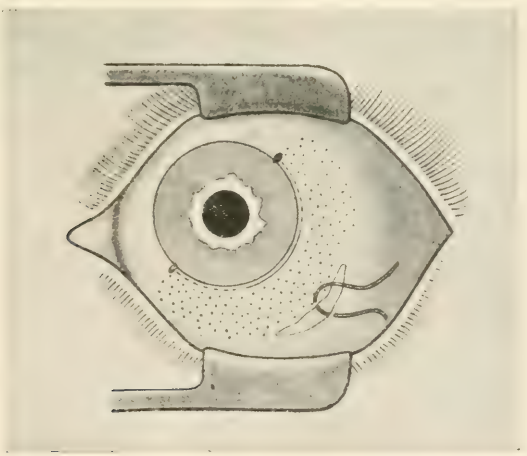
Dimmer, F. The sub-conjunctival extraction of cataract. (Eine subkonjunctivale Methode der Starextraktion.) *Bericht der Ophthal. Gesellschaft*, Heidelberg, 1907, Volume published in 1908, p. 218.

According to **Dimmer** (Graz), our usual methods of extracting cataract are somewhat unsurgical. Thus, the conjunctiva cannot be sterilised: the incision is not sutured; and if the wound be covered by conjunctiva, the superficial wound lies in close proximity to the deeper. In order to protect the wound better, Kuhnt covered the surgical incision with a double pedunculated flap of conjunctiva. Desmarres, Horner, Vacher, Pansier, and Czermak operated by subconjunctival methods.

Of these various procedures, Czermak's appears *a priori* to be the best. For example, it protects the wound from septic infection, and has great advantages where prolapse of the vitreous is expected or where for any reason the after-treatment is likely to be difficult. The downward section, without iridectomy, affords the best protection against prolapse of the iris. There are, nevertheless, disadvantages attaching to the operation, such as the technical difficulties of making the conjunctival pocket after the eye has been opened. Again, the scleral wound in the neighbourhood of the puncture is not very far from the conjunctival incision, and here the protection seems insufficient. The incision starts from a laterally-placed puncture, and this involves a technical difficulty, for the whole lower half of the cornea must be cut in a circular manner with scissors. It is very difficult to judge correctly the right size of the incision. The conjunctiva can easily be lifted away from the sclera, and fluid drawn from the conjunctival sac into the conjunctival pocket. It is a great disadvantage that the entire section must be made with scissors. The suture of a meridional wound can easily favour prolapse of the iris, and if a prolapse occurs, it is very difficult to excise it.

Dimmer performs his operation in the following manner :—

A day or more before the operation the two ends of a meridian of the cornea lying at 45° downwards and inwards are tattooed with Indian ink (see diagram). Before the operation, a



few drops of cocaine solution with adrenalin are injected under the conjunctiva downwards and outwards. With the scissors an incision about 8 mm. long is made in the conjunctiva parallel to the tattooed meridian 8 mm. from the limbus. A pocket is now dissected up 8 mm. broad extending from one

tattooed point to the other. In the diagram the dotted portion indicates the pocket. The scleral incision is made in three stages. The central one with a broad-pointed knife 2·5 mm. broad (? Taylor's knife) which is bent like a short keratome. This section is extended in each direction with a special pair of scissors till it reached the Indian ink spots which are introduced under the conjunctiva. These three stages are indicated in the diagram, the central incision by an unbroken line, the scissors' cuts by a dotted line. A fine silk suture is now placed in the conjunctival wound. The capsule is ruptured, and the lens delivered with two bent spatulæ. The iris in most cases returns naturally to its normal position with a round pupil, but it may be necessary to replace it. Lens matter can be expressed with the spatula, or with Daviel's spoon. Finally, the conjunctival suture is tied. The operation takes from 8 to 10 minutes.

Dimmer has latterly extracted all his cataracts by this method, and finds that any kind of lens can be successfully removed from the eye. A small nucleus or a large amount of soft matter does not cause more trouble than in an ordinary extraction.

The disadvantages of the operation are: a somewhat longer period of healing; further, in case of vitreous prolapse or prolapse of the iris a coloboma must be placed downwards and outwards. Detachment of the choroid is more frequent than with the usual method, but it reattaches itself after a longer or shorter time. All the advantages of Czermak's method are intensified, and the disadvantages avoided.

Discussion.—In the discussion which followed the reading of Dimmer's communication, Kuhnt pointed out that the conjunctival incision, as shown in the diagram, seemed to him very small. He considered that the irregular, three-stage section was very undesirable and often closed badly, that there was often troublesome hæmorrhage in making the pocket, and that the possibility of aspiration of fluid from the *cul-de-sac* and lachrymal passages was very dangerous. When vitreous prolapses the lens must be removed quickly with the vectis, a difficult matter to effect at the bottom of a conjunctival pocket. At present only from 1 to 2 per cent. of all extractions are lost from sepsis, and it seemed hardly necessary to introduce so many complications to legislate for these rare accidents. He thought that when it was necessary to cover the wound with conjunctiva, it was much better either to make a scleral incision with a conjunctival flap or a corneal section covered by a double pedunculated flap which had been prepared before the section was made. Scharwz could not understand the frequency of detachment of the choroid. Was it due to excess of cocaine and adrenalin? Elschnig did not consider the operation difficult, and considered tattooing the ends of the incision to be superfluous. He was in full agreement with all Kuhnt had said.

Dimmer answered that the conjunctival incision was as small as shown on the diagram, but it often got larger from tearing. He thought detachment of the choroid was caused by ruptures in the neighbourhood of the ligamentum pectinatum.

T. HARRISON BUTLER.

IV.—PATHOLOGY.

(1) **Mayou, M. S.—On implantation dermoids of the conjunctiva.** *Royal Lond. Ophthal. Hospital Reports*, Vol. 16, Part 3.

(2) **Cosmettatos, G. F.—Multiple fibrous polypi of the conjunctiva.** *Ophth. Klinik*, Januar, 1906.

(3) **Casali, A.—Contribution to the ætiology of retinitis proliferans.** *Annali di Ottalmologia*, Vol. XXXV, Fasc. 1-2.

(4) **Santucci, S.—Contribution to the study of ocular tuberculosis.** *Annali di Ottalmologia*, Vol. XXXV, Fasc. 1.

(5) **Casali, A.—Contribution to the pathological anatomy of hæmorrhagic glaucoma and of retro-choroidal hæmorrhages.** *Annali di Ottalmologia*, Vol. XXXV, Fasc. 5-6.

(6) **Fabris, Ugo.—A note on a case of embolism of the central artery of the retina.** *Rivista Italiana di Ottalmologia*, June, 1906.

(7) **Mathieu, J.—A contribution regarding tumours of the limbus.** *Archiv für Augenheilkunde*, Juni, 1906.

(8) **Laspeyres, K.—Angiolipoma of the eyelids and orbit.** *Zeitschrift für Augenheilkunde*, Juni, 1906.

(9) **Baquis, E.—On the congenital glandular tumour-like malformation in the anterior segment of the eyeball.** v. Graefe's *Archiv für Ophthalmologie*, Juni 26, 1906.

(10) **Früchte, Wilh.—On implantation of epithelium in the lens.** *Klin. Monatsbl. f. Augenheilkunde*, September, 1906.

(11) **Cosmetattos.—Lymphoma of the semilunar fold.** *Annales d'Oculistique*, avril, 1907.

(12) **Fischer, F.—Granuloma of the conjunctiva.** *Arch. f. Augenheilkunde*, April, 1907.

(13) **Perrod, G.—A contribution to the study of iridocyclitis, pigmented hypopyon, and pigmented embolism of the iridic angle.** *Annali di Ottalmologia*, Vol. XXXVI, Fasc. 6-7.

(14) **Felsch, Hildegard. — Anatomical contributions on spindle-shaped cataract, nuclear cataract, posterior lenticonus, and colobomatous formations in the lens.** *Arch. f. Augenheilkunde*, September, 1907.

(15) **Salzmann, M. —On the pathology of keratoconus.** v. Graefe's *Archiv f. Ophthalmologie*, November 19, 1907.

(16) **Kraemer, R.—Contributions to the morphology of "phacocele."** v. Graefe's *Archiv f. Ophthalmologie*, November 19, 1907.

(17) **Werner, Louis.—A peculiar case of subretinal cysticercus, with ophthalmosopic drawing and microscopic examination.** *Trans. Ophthal. Society* U.K., 1907.

(18) **Aubineau.—Primary tumour of the palpebral conjunctiva accompanied by a tumour of the cornea.** *Annales d'Oculistique*, février, 1908.

(1) Implantation cysts of the conjunctiva occur in two ways: either by down growth of the surface epithelium following a wound, the surface epithelium being subsequently cut off; or else by direct carrying of the conjunctival epithelium by a foreign body. A case is recorded in which **Mayou** (London) examined the cyst one week after the eye was injured by a piece of wood striking the eye. The cyst was formed round a piece of wood which was carried beneath the epithelium at the time of the injury. It had no connection with the surface, and the cells lining the cyst were obviously derived from some conjunctival cells which had been carried in to the deeper parts by the foreign body.

Another case in which the history is not so definite is recorded, in which the epithelium lining the cyst was evidently derived from the surface epithelium, but no connection could be demonstrated between the two. The histological characters of the cells are shown in a plate which accompanies the paper.

C. D. M.

(2) **Cosmettatos** describes a case of multiple, small, pedunculated tumours growing from the conjunctiva of both eyes in a child aged seven years. Microscopically, they were found to have a covering of stratified epithelium, underneath which there was a delicate, very vascular stroma of connective tissue, the spaces of which contained spindle-shaped embryonic connective tissue cells. PERCIVAL J. HAY.

(3) The clinical and ophthalmoscopic details of the case related by **Casali** (Sienna) confirm the retinal hæmorrhagic origin of the retino-vitreous formations in so-called retinitis proliferans. The clot, floating in the vitreous and remaining adherent to the wall of the interrupted vessel, provokes an inflammatory reaction on the part of this latter and of the

surrounding tissue; by the absorption of the fluid part of the clot, and by the organization of leucocytes invading this latter, connective tissue cicatricial bands are formed, and to these are added secondarily proliferation of the sustentacular fibres of the retina. A. ANTONELLI.

(4) After a rapid historical review of the literature of ocular tuberculosis, **Santucci** (Turin) describes the lesions found in an anatomico-pathological examination, unfortunately not preceded by any clinical observation. An eyeball removed from a man of 20 years, who had died of an acute disease (?), showed granulomatous lesions of the posterior pole, large tubercles in the layer of large vessels of the choroid between papilla and macula, tuberculous infiltration invading the deep layers of the retina, infiltration of the chorio-capillaris, papillary œdema and optic neuritis, granulomatous invasion and destruction of the retinal layers, etc. All attempts to stain the bacilli failed. The author asserts that ocular tuberculosis is not very rare, that it may pass unnoticed during a certain period, at least, of its evolution, and that it may represent a primary and sole focus of infection of the organism. The seat of election is the posterior pole of the eyeball, in very vascular tissues such as the choroid (commencing in the middle layers close to the chorio-capillaris), and it finds in the sclerotic an almost insurmountable barrier. Retinal invasion is secondary, and takes place first of all in the fibrous layer. A. ANTONELLI.

(5) **Casali's** work, like every other histo-pathological description, does not lend itself to abstraction. It should be read in the original, with the assistance of the micro-photographic drawings. It is provided with a bibliographic index on these subjects. A. ANTONELLI.

(6) **Fabris's** case is interesting since after a typical history, an autopsy was obtained some two years after the accident. "The wall of the artery, both in the middle and external coats, showed the characters of the hyaline degeneration, with marked reduction of the number of fibre-cells; the endothelium was modified in the region of the lamina cribrosa, and presents here and there small elevations of proliferation. At the level of the junction between the anterior two-thirds and the posterior third of the lamina, the lumen is entirely blocked by the presence of a mass which appears stratified, and is in part adherent to the wall. The centre is made up of a substance partly granular, partly hyaline, surrounded by a layer of connective tissue, with few connective elements, and near its surface by a mass of very fine vessels. Behind this mass the lumen of the artery remains."
H. GRIMSDALE.

(7) **Mathieu's** paper contains reports on the macroscopic and microscopic appearances of three benign tumours of the limbus, all of them of epithelial origin. Two appeared to be papillomatous in character, whilst the third, which occurred in a

young man of twenty-six, resembled both the unpigmented nævus and the benign cystic epithelioma. The latter had taken some years to grow, was smooth, soft and jelly-like to the touch, adherent to the limbus, but movable upon the sclera. Microscopically, it consisted chiefly of groups of cells and cystic spaces lying in a delicate connective tissue stroma, that showed a more or less diffuse cellular infiltration. As regards the origin and formation of the tumour, Mathieu believes, that germinal epithelial cells were thrust into the underlying tissue where they continued to grow to a certain extent, and, further, that the epithelium sent in papillomatous processes, which subsequently underwent cystic degeneration. PERCIVAL J. HAY.

(8) After referring to the rarity of this condition, **Laspeyres** recounts his own case, in a boy, three years old, who in the third week of whooping cough developed blue rings beneath both eyes. These were taken to be hæmorrhages resulting from whooping cough, and, later, the blueness under the left eye disappeared. In the right, however, it persisted, and gradually a tumour formed. This, later on, was removed, and found to consist of two parts—one an almost pure lipoma, while the other, the angiomatous tissue, was much in the ascendant. There was no recurrence. A. LEVY.

(9) **Bagnis** had an opportunity of examining microscopically a case of congenital malformation where a capacious growth covered the temporal part of the eyeball and a contiguous segment of the cornea, extending to both fornices conjunctivæ. The tumour was found to consist of an accumulation of acino-tubular glands of Krause's type, opening with numerous ducts on the bulbar conjunctiva: two cartilaginous portions were also present, and on one spot a dermoid character prevailed, but this was not a marked feature of the tumour. There were also two opacities in a part of the cornea, which was not covered by the tumour, which Bagnis thinks were attributable to fœtal inflammation. The author discusses the various theories which have been advanced for the explanation of the complex formation of these tumours, especially with regard to their glandular and cartilaginous compounds. R. GRUBER.

(10) A boy, aged 5 years, received a severe perforating wound of the cornea, which under conservative treatment, led to sympathetic ophthalmia. The injured eye was then enucleated and examined microscopically by **Früchte**. Apart from inflammatory changes characteristic of sympathising ophthalmia, according to Fuchs, epithelial inclusions were seen, not only in the iris but also in the cataractous lens. They represented the early stage of pearl cysts and were evidently derived from the corneal epithelium. A nucleus of granulation tissue was seen in the centre of each epithelial nest. C. MARKUS.

(11) **Cosmettatos's** patient, a boy aged 11 years, had a painless, soft, mobile, rose-coloured tumour, covering the whole

of the semilunar fold of his left eye. This was removed under cocain, and found to measure 5 mm. by 3 mm. and to consist of: 1. a layer of stratified pavement epithelium, representing the ordinary epithelium of the semilunar fold; 2. a layer of connective tissue containing blood vessels; 3. a mass of cells resembling lymphocytes lying in a connective tissue reticulum. As there was no enlargement of the spleen or glands, and no increase in the number of white corpuscles, the author considers the case to be one of simple lymphoma. R. J. COULTER.

(12) **Fischer** describes the macroscopical and microscopical appearances of an inflammatory new formation of the conjunctiva, caused by a grain of barley which had been lying underneath the upper lid for six weeks. The growth consisted of a vascular network in the meshes, of which there was some young connective tissue, with a large number of round cells. There was no epithelial covering. P. J. HAY.

(13) **Perrod's** contribution is interesting, especially from the point of view of the pathogenesis of cases of secondary glaucoma or of glaucomatous syndrome closely following various kinds of uveitis. A. ANTONELLI.

(14) The ætiology of the spindle-shaped cataract is still an open question. **Miss Felsch** reports upon two cases of this kind which she observed in a rabbit and examined microscopically. They appear to throw some light upon some points in the development of this form of cataract. The following changes were noted: (1) rents in the nucleus, especially in the outer layers, and degenerative changes, as shown by the presence of myelin drops, deeply-stained debris, and granules of pigment; (2) extension of these degenerative changes backwards along the line of the antero-posterior axis; (3) approximation of the nucleus to the posterior pole; (4) cavity formation at the posterior pole, (5) a thickening here of the capsule, which contained some endothelial cells; (6) a strand of some ill-defined substance extending from the lens to the disc—possibly the remains of the hyaloid artery. In one of the eyes there was, in addition to this, a rupture in the posterior capsule and a posterior lenticonus. In discussing the ætiology of the two cases, Felsch comes to the conclusion that the hyaloid artery persisted for an abnormally long time, and that, perhaps, a too intimate relation existed between it and the posterior capsule—a conclusion which is supported by the presence of endothelial cells in the latter—and, further, that the persistence of this vessel led to disturbances of nutrition and consequent changes in the capsule and lens. The more extensive capsular changes in one of the cases may owe their origin to traction on the part of the artery. The circumstance, that there are cavities present in both cases, leads Felsch to discuss their relationship to coloboma of the lens. Vessels and strands of connective tissue, so often associated with coloboma of the lens, have been regarded as

remains of embryonic vessels and tissues to the persistence of which the coloboma was due. In the cases in question the conditions are similar and the writer concludes, that cavity formation underneath the posterior capsule is closely related to true coloboma of the lens. PERCIVAL J. HAY.

(15) **Salzmann's** paper is based on anatomical examination of an eye from an epileptic idiot; there was also hypermature cataract and atrophic changes of the optic nerve and the vitrous present, which were in all probability unconnected with the keratoconus. The anatomical changes which produced the latter were not any different from what Uhthoff, Fleischer, and others have described. But Salzmann lays special stress on slight changes of the marginal zone of the limbus, which, although of little importance in themselves, point to a defect of development in the anterior segment of the eyeball. These changes refer to the appearance of a curious layer of connective tissue within the perpetual part of the membrana Descemetii, shortening of the trabeculum corneo-sclerale, and thickening of ligamentum pectinatum.

R. GRUBER.

(16) Though Birnbacher introduced the name "phacocele" for a well-defined condition as early as 1884, the term has not been generally taken up. **Kraemer** therefore deserves credit for drawing attention to it and its practical importance and for reporting several cases of this affection, which may easily be overlooked. Phacocele means the expulsion of a small pearl of lens-substance through an ulcerative or traumatic gap in the cornea or in the corneo-scleral region; as a rule, it prevents the closing of the opening; it may spontaneously burst, with or without expression of the whole lens, and it often leads to secondary glaucoma. Its pathology differs somewhat according to its origin. In corneal ulcer a central site predisposes to its formation, but, of course, the ulcer must be neither too small nor too big and the lens have remained at least partly soft. It is favourable for its development if the zonule remains intact as its tension leads to increased convexity of the anterior pole and this facilitates the formation of a "hernia lentis." In traumatic phacocele the perforation is always peripheral and primary luxation of the lens is practically essential. The latter class of case is extremely rare. R. GRUBER.

(17) The peculiarities of the case, reported by **Werner** (Dublin), are that it was intra-retinal, and that, in spite of Salzmann's dictum, "as long as the pupil permits the passage of light the cysticercus is certainly alive," this bladder worm was dead and degenerated, although the media were clear. Further, it is the first case, excluding those in the anterior chamber, which has been met with in Ireland. The author gives a description of the cyst (with plate) as seen with the ophthalmoscope: the condition could not be diagnosed. The patient, a male, aged 19 years, had no symptoms except deterioration of

vision. The eye was enucleated because of the doubtful diagnosis. Evidence of the parasitic nature of the case consisted in the presence of degenerated remains of the head and neck and of a well-preserved sucker. The worm had succeeded in escaping from its capsule, but had been unable to push its way through the anterior layers of the retina into the vitreous, in which subretinal cysticerci are usually found, and had died before it could give rise to any of the usual inflammatory changes. There was not sufficient evidence to prove whether the cysticercus was that of tænia solium or of tænia mediocanellata. The ophthalmoscopic and microscopic descriptions are clear and interesting, and should be read in the original.

ERNEST THOMSON.

(18) **Aubineau's** patient, a woman, aged 53 years, had two tumours in her right eye. One of these was situated deeply in the upper lid at the level of the superior border of the tarsus, was the size of a nut and was covered by conjunctiva except in a horizontally elongated area where the neoplastic tissue was bare. The other, which covered the upper half of the cornea and invaded the palpebral conjunctiva for 4 mm. or 5 mm. on the inner side, corresponded accurately in position and shape with the bare area on the conjunctival growth. Both tumours were removed and 18 months later the patient was free from recurrence. The conjunctival tumour was found to consist of numerous cells of varying size and shapes disposed in parallel rows. There was a stroma which was badly developed, except in the neighbourhood of the capsule and vessels. The vessels were mostly capillaries, but there were a few of moderate size possessing an endothelium and a wall formed of small flat cells separated from each other by fine bands of connective tissue. Frequently the vessels were surrounded by a veritable sheath of small round cells, evidently embryonic and pointing to inflammatory irritation. The capsule covered only part of the tumour. It consisted of parallel connective tissue fibres containing numerous cells with all the characters of the fixed cells of normal connective tissue.

The corneal tumour contained cells of the following type: 1. small inflammatory cells; 2. epithelioid cells with large granular nuclei often double containing one, two, or three nucleoli. The stroma formed a veritable reticulum with small meshes some of which contained only one cell. In the interstices between the meshes of the reticulum, the fixed cells of the tissue were seen as small, star-shaped cells. The vessels were few in number and, as a rule, not bigger than large capillaries. The tumour was covered in the greater part of its extent by a capsule unusually fine consisting of one or more layers of large flat cells recalling the structure of the cornea. At the limit of the fore surface of the tumour this capsule was considerably thickened, and it was difficult to separate its cells from those of the tumour.

In spite of the difference in structure between the corneal and the conjunctival growth, Aubineau considers that the former was due to inoculation from the latter and that they should both be classified as non-malignant endotheliomata. He states that there are 7 recorded cases only of primary tumour of the palpebral conjunctiva in addition to his own.

R. J. COULTER.

V.—A TEST FOR BINOCULAR VISION.

1. **Roche, Charles.—A simple and rapid method of establishing the presence of binocular vision. (Moyen simple et rapide permettant de s'assurer de l'existence de la vision binoculaire.)** *Ann. d'Oculistique*, T. CXXXIX, p. 43, janvier, 1908.

2. **Chabal, Léon.—On the new procedure of Dr. Roche. (Sur le nouveau procédé du Dr. Roche.)** *Ann. d'Oculistique*, T. CXXXIX, p. 368, mai, 1908.

(1) **Roche** suggests the following simple test for determining whether alleged monocular amblyopia is real or simulated. Take a surface of uniform colour, such as a blotting pad, and hold horizontally, touching the root of the nose; then place on it a small ball of paper or bread and attempt to bring the point of a pencil down vertically so as to touch it. This can easily be done if both eyes are open If one eye is shut it is very difficult to touch the test object, but the pointer is always placed on the right line joining the eye and the test object or on its prolongation. This would probably lead to the detection of malingerers, who, if they suspected a trap, would very probably bring the pointer down on one or other side of the line on which it ought to be placed. In a letter referring to this article, Ambialet (*Ann. d'Oculistique*, T. CXXXIX, p. 240) quotes the celebrated experiment of Malebranche (*Des Sens*, liv. I, chap. IV). This consists in hanging a ring up by a thread so that its opening is not turned towards the experimenter, and when standing three or four paces from it with one eye shut attempting to pass through it the point of a bent rod.

(2) **Chabal** (Marseilles) finds that the method proposed by Roche for establishing the presence of binocular vision is not reliable when dealing with people who have been one-eyed for any considerable time. He explains the exception in such cases as being due to development of the power of judging distance by accommodation. He also points out that anyone who is shewn by this test to be one-eyed will always put the pointer in front of the test object if he is hypermetropic but behind, if he is myopic.

R. J. COULTER.

VI.—A NEW EYE SYMPTOM IN RABIES.

Coakley, W. Byron.—A pathognomonic eye symptom in rabies *New York Medical Journal*, July 6th, 1907

While studying the pathology and clinical symptoms of rabies in animals, **Coakley** noticed a peculiar scum which partially covered the left eye of a mad fox-terrier dog. On wiping away this discharge he found "the pupil in pin point contraction and uninfluenced by light, the cornea and conjunctiva were analgesic, and the outer layers of the former were destroyed." This animal was just entering upon the last stage of the disease, and was still strong and furious. After applying atropine at intervals of ten minutes for one hour, the author failed to influence the contraction. Cocaine was then tried, with the same result. He then administered large doses of atropine hypodermically with negative results. After a wait of four hours he gave a large hypodermic injection of cocaine; the result was the same as before. At the end of eight hours after the original observation, the contracted pupil suddenly dilated "to about the size of a large match head," while the pupil of the right eye remained practically unaffected. The animal at this time was very weak and unable to stand. Its respiration was laboured and the heart sounds were indistinct. Two hours and thirty-five minutes from this time it died. The *post-mortem* findings were about the same as those usual in a rabid dog. The next mad dog that was entered at the infirmary showed the same eye phenomenon as in case No. 1, with the exception that both pupils were contracted. Atropine and cocaine were used locally and injected subcutaneously in somewhat larger doses than in the first experiment. The results were negative. "Death took place one hour and thirty-five minutes after the pupils dilated, or nineteen hours after the last injection of cocaine." The next case with this sign "was subjected to experiment in an effort to locate the cause of the contraction in either the optic tract or in the cord. Alcohol, opium, morphine, codeine, carbolic acid, eserine, and chloral were each given to a normal animal in gradually increasing doses until death was produced. "These drugs" (the author says) "all produce a contracted pupil in the human eye, but in no case could the pupil of the dog be made to resemble the findings seen in a rabid animal. These drugs were also given in doses sufficiently large to produce rapid death, but the result was the same." The clinical and pathological findings in the eyes of 114 dogs were then noted. As a result, the author states that: "The pupillary contraction which sometimes follows the sudden removal of an animal from a dark cage to a bright light, and the sluggish pupil reaction of a very sick animal, must not be confounded with the symptom just described. If there is any doubt as to the permanency of the

contraction, mydriatics should be used at once; if mydriasis is secured and the animal lives for several hours, one can be sure he is not dealing with a case of rabies. A dilatation which might follow the use of a mydriatic must not be confounded with the dilatation which always precedes death. If at the autopsy on an animal in which the eye symptom has been present during life, changes are found which would strongly suggest death from causes other than rabies, one must not be led to a change in diagnosis, for in two of the author's cases extensive consolidation was found in the lungs, and brain inoculation from these animals caused the death of two sets of rabbits with typical rabetic symptoms. An iris which is deeply pigmented on the inner margin, will, when contracted, resemble closely a moderately dilated pupil, but careful inspection will reveal the true condition. The ophthalmoscopic examination is usually made during the last stage of the disease, but can, if the animal is not too furious, be made any time after dilatation has taken place. For close examination of the eye, the animal is first secured with a long stick twitch; a heavy cord is then passed around the jaws and securely tied at the back of the ears, the face is covered with a towel wet in a 1-500 bichloride solution, and the animal held in position by two assistants. In an experience, covering a period of more than nine years, in which time I have had an opportunity of observing hundreds of animals, I have yet to see the symptom described in the preceding in any disease other than rabies." C. A. O.

VII.—SOME OCULAR MANIFESTATIONS OF HYSTERIA.

(1) Galezowski, X.—Some ocular manifestations of hysteria. (Quelques manifestations oculaires de l'hystérie.) *Recueil d'Ophtalmologie*, janvier et février, 1907.

(2) Langer, Max Konrad.—Upon contraction of the fields according to the type of Foerster or Wilbrand. (Ueber Gesichtsfeldenischränkung nach dem Foerster oder Wilbrandschen Typus.) *Beitrage zur Augenheilkunde*, 68 Heft, Juni, 1907.

(3) Meyers, D. Campbell.—The eye symptoms in hysteria. *Canada Lancet*, May, 1908.

(1) The cases recorded by **Galezowski** (Paris) in this paper are: one of hysterical myosis and spasm of accommodation; a case of hysterical amblyopia with ptosis, central scotoma, and

superointernal hemiopia; one of spasm of some of the muscles supplied by the third nerve, with diplopia and vertigo; and one of hysterical myosis and spasm of accommodation, associated with dyschromatopsia and migraine. Galezowski insists on the diagnostic value of dyschromatopsia in hysteria. It is important to recognise its variability; colours may be recognised by the patient at a distance of 5 or 10 centimetres, but confused at a distance of 25 or 50 centimetres. For its investigation the author recommends the use of his colour-board, each side of which carries eight coloured squares, 4 centimetres in size, and one or more of which can be exposed at will. The dyschromatopsia may be monocular or binocular.

In the treatment of spasm of the sphincter and ciliary muscles, Galezowski employs duboisin drops, with the internal administration of sedatives, such as narcein, benzoate of sodium, antipyrin, citrate of caffein, and quinine. In certain cases he also applies an antineuralgic plaster to the painful spots on the back, neck, temple, etc. This plaster contains morphia, conium, and cocain. Galezowski gives the following summary of the most important points with regard to hysterical amblyopia :—

(1) Hysterical visual troubles are generally monocular, and correspond to the hemianæsthetic side.

(2) When a binocular hemianæsthesia is present it is always more marked on one side than on the other.

(3) When the fibres of the iris are involved, the general result is a monocular myosis. Sometimes, a spasmodic myopia may be associated with it.

(4) Hysterical dyschromatopsia of one or both eyes is never complete and varies according to distances, point of fixation, and portion of the retina.

(5) The field of vision is generally concentrically contracted.

(6) Visual acuity is always more diminished in one eye than in the other. J. Jameson Evans.

(2) Foerster was the first to draw attention to a peculiarity of the fields in anæsthesia retinæ. The knowledge of this abnormity and of the methods of examining for it have since been perfected by Wilbrand, who introduced for it the term: "Foerster's type of displacement" (Foerster's *Verschickungstypus*). The peculiarity of this condition consists in the patient recognising the test object sooner if it is moved from the periphery to the centre of the perimeter than in the opposite direction. Thus, if two fields are taken, one by moving the test object from the temporal to the nasal side, and the second in the opposite direction, these two fields are different and will intersect, each being larger in the direction of the first appearance of the object. Various importance has been attached to this symptom, which is also sometimes called "contraction from fatigue." Some have even completely denied its pathological value (Schmidt-Rimpler), but **Langer's**

tests prove that it is never present in healthy subjects, and cannot be simulated even by intelligent persons. By examining a great number of patients suffering from epilepsy, traumatic neurosis, hysteria, etc., the author finds that this symptom is nearly akin to concentric contraction, perhaps only an initial stage of, and frequently superimposed upon, the latter. It must certainly be considered of diagnostic value if the "displaced contraction" exceeds 5° to 10°.

R. GRUBER.

(3) Total blindness, as the result of hysteria, according to **Meyers** (Toronto), is uncommon, although its existence has been known for years. In such cases the frequent absence of corneal or conjunctival reflex, despite the perfect nature of the pupillary response to light and to accommodation, should put the practitioner on his guard. But an error in diagnosis can be avoided only by a careful physical examination of the patient, conjoined with the use of the ophthalmoscope. Two cases of complete blindness due to hysteria are mentioned by Meyers. Sight was recovered by one of the patients in "several months" and by the other in three years and ten months. Apart from blindness, some of the most characteristic symptoms of ocular hysteria are afforded by examination of the visual fields, which, when at all pronounced, can be detected at the bedside by the finger test without the aid of any special apparatus, such as the perimeter. Meyers describes three of these signs: (1) concentric contraction; (2) reversal of colour fields; and (3) colour obliteration. A concentric contraction, he believes, is found only in this form of neurosis. Reversal of the colour fields affects those for red and blue, so that the latter, instead of being larger, as in the normal condition, is equal in size to, or even smaller than, the former. Another remarkable phenomenon is that in proportion as the field for white contracts, the fields for the other colours become more restricted, and, finally, if the contraction for white be extreme, are squeezed out of the centre, the violet being first obliterated, the green, red, yellow, and blue following in the order named. SYDNEY STEPHENSON.

VIII.—THE CALMETTE REACTION.

(1) **Benedict, A. L.—The ophthalmic tuberculin test.** *New York Medical Journal*, June 27, 1908.

(2) **Satterlee, G. Reese.—A serious result of the ocular tuberculin test.** *Journal American Medical Association*, June 27, 1908.

(3) **Parker, Harry C.** — **The Calmette ocular reaction to tuberculin.** *Journal American Medical Association*, June 27, 1908.

(4) **Butler, T. Harrison.** — **The dangers of Calmette's ophthalmo-reaction.** *British Medical Journal*, August 8, 1908.

(1) **Benedict** (Buffalo) believes that the ophthalmic tuberculin test is of some use in the diagnosis of tuberculous conditions of the lungs. He has found that it is of ætiologic value in lupus vulgaris "and tuberculides of the type of necrotic granuloma (follicles)." C. A. O.

(2) **Satterlee** (New York City) reports a clinical case of adenitis "with the probability of a superimposed tuberculosis" in an eighteen year old school girl, into whose left conjunctival sac Satterlee had instilled two drops of 1 per cent. strength solution of tuberculin. A coarse vascular keratitis, which was practically cured after five weeks' treatment, was produced. "A small piece of tumor in the left cervical region was removed, and showed a condition of coagulation-necrosis and giant-celled formation, which were evidently tuberculous in nature." No definite diagnosis of a supposed Hodgkin's disease could be determined in the case. C. A. O.

(3) **Parker's** (Indianapolis) conclusions are as follows: "The diagnostic importance of the Calmette ocular tuberculin test is as great as that of any other single test, a positive reaction being indicative of a tuberculous focus. It is unreliable in subjects under two years of age, and fails in advanced cases of tuberculosis." In order to prevent severe inflammatory reaction, Parker makes the initial instillation with a solution which is less than 1 per cent. in strength. Should it become necessary to make a second and a stronger test, he does it in the other eye. He has found that the consensus of opinion seems to be against employing the test in an eye which is not normal. After-complications occur from its use, but these can be removed in varying periods of time. For diagnostic purposes, a 1 per cent. strength solution of Koch's "old" tuberculin has proved to be nearly as good as the Calmette solution. In view of the fact that recent investigations have shown a greater number of ophthalmic affections due to tuberculosis than had been supposed, he believes that in the Calmette reaction test there is a simple means of differential diagnosis which should be thoroughly tried. He says that the reaction is especially valuable for determining the nature of cases of "phlyctenular keratitis and conjunctivitis, episcleritis and scleritis, chronic iritis and iridocyclitis, interstitial keratitis, and chorioiditis," and is of the opinion that as the test has given such uniformly excellent results, its value is practically assured.

CHARLES A. OLIVER.

(4) **Butler** (Coventry) reports three cases in children where the employment of Calmette's tuberculin to eyes previously healthy is stated to have produced bad results. In the first case a kind of trachomatous conjunctivitis speedily followed the use of 0·5 per cent. and 1 per cent. tuberculin, and about a month later, the child, evidently a tuberculous subject, developed phlyctenular keratitis. Butler's conclusion, namely, that "as a result of the instillation of tuberculin, a typically tuberculous process was set up in a perfectly healthy eye," appears to be scarcely borne out by the facts of the case when looked at critically. How far one is justified in speaking of a phlyctenular keratitis as "a typically tuberculous process" is a question open, at all events, to argument. Butler's second case resembled to some extent the first, except that the phlyctenular process, which developed about a month after use of the tuberculin, again did not involve the cornea. It was preceded by a violent reaction, followed by a chronic inflammation of the conjunctiva. In the third case the use of 0·5 per cent. and 1 per cent. tuberculin was succeeded by "a violent muco-purulent conjunctivitis *in both eyes*, which became chronic and resisted all treatment for two months." The author now employs injections of old tuberculin (P.G.) instead of Calmette's method, in order to determine the tuberculous or non-tuberculous nature of a given disease. In conclusion, the reviewer would venture to remark that Calmette's ophthalmo-reaction may not be infallible. At the same time it is certainly not so dangerous as Butler asserts, when any large series of cases is analysed. SYDNEY STEPHENSON.

IX.—INJURIES OF THE EYES AND THEIR TREATMENT.

Siegrist, A.—Injuries of the eyes and their treatment. (Die Verletzungen der Augen und ihre Behandlung.) *Correspondenz-Blatt für Schweizer Aerzte*, 15 November, 1906.

Siegrist gives a clear and wide review of the injuries which may befall the eye. A peculiar effect observed by him in five eyes, from contusion, was that of the formation of a yellowish, map-like area near the papilla, which gradually became more and more pigmented. This appearance is ascribed to rupture of ciliary vessels. Siegrist emphasizes the fact that constitutional diseases, *e.g.*, syphilis and tubercle, may only show themselves in the eye after some injury. As treatment of infected wounds of the eye, he advocates (1) destruction of the wound-borders and of the affected part of the vitreous by the thermo-cautery;

(2) subconjunctival injections of *weak* mercurial solutions, or of salt solution, which act only by increasing the local circulation; (3) repeated puncture of the anterior chamber, thus relieving tension, and allowing escape of infected fluids, followed, perhaps by washing out the chamber with *weak* antiseptic solutions; (4) intra-ocular disinfection by the insertion of iodoform rods into the anterior chamber or the vitreous. The results of the last method of treatment are sometimes valuable, sometimes not. As general means, the author advises iodides and mercury, the latter especially when given as an inunction. ROSA FORD.

X.—VASCULAR CHANGES IN SYPHILIS.

von Michel, J.—On the pathologico-anatomical changes in the blood-vessels of the eye in syphilis. (Ueber die pathologisch-anatomischen Veränderungen der Blutgefässe des Augapfels bei Syphilis.) *Zeitschrift für Augenheilkunde*, Oktober, 1907.

Michel (Berlin) gives an account of a case of widespread disease of the blood-vessels of an eye, which had not been suspected until the enucleated globe was microscopically examined. The specimen was removed from a young man who presented himself with very high tension in the left eye. On account of opacity of the cornea and vitreous, the fundus could not be examined. The right eye was normal. There was a suspicion that the glaucoma was caused by a tumour, and so the eye was removed. Examination of the latter showed that the disease was due to syphilis. The patient had not mentioned the fact that he had suffered from syphilis, and there was no opportunity of examining him for signs of the disease; the diagnosis therefore rests solely upon the pathological condition revealed by the sections.

Taking the various parts of the eye *seriatim*:—the limbus of the *cornea* shows a small-celled infiltration which tends to gather round the blood-vessels, which, however, show no disease of their walls. The same is true of the blood-vessels within the sclera. The small-celled infiltration of the *sclera* is exclusively confined to the course of the vessels which perforate it, and here and there it forms a large collection in their neighbourhood (*cf.* Fig. 1. J in the text). Where the conjunctiva becomes merged into the cornea the epithelium is much vacuolated, and is commencing to desquamate (*cf.* Fig. 1, E). The posterior wall of the cornea is completely covered with round cells (*cf.* Fig 1, M) which are unevenly distributed and tend to form large local aggregations. The infiltration is especially noticeable in the ligamentum pectinatum (Fig. 1, L) and is here grouped round the vessels, and infiltrates the scleral tissue.

The *iris* is irregularly dotted with small knot-like foci, each containing a central blood-vessel (Fig. 1, GG). They consist of a collection of round cells which have accumulated into a dense mass round the vessel, and which have penetrated into its adventitia. The tunica media is unaffected, but the intima is also infiltrated, (Fig. 2, GG), and in many places shews granulations (Fig. 2, J). The *ciliary body* is unaffected.

The *choroid* is completely and evenly infiltrated with innumerable lymphocytes, and is proportionately thickened. The choroidal vessels are normal except as regards the adventitia, which is infiltrated with round cells (Fig. 3, G.G.). The choriocapillaris is completely covered with round cells, but the membrane of Bruch and the pigmented layer of the retina are normal. The layer of nerve-fibres in the neighbourhood of the optic nerve is infiltrated with small round cells; the rest of the retina is normal.

There are marked changes in the *papilla* and its immediate neighbourhood. The *arteria centralis retinæ* (Fig. 4 A) is freely infiltrated with small round cells and the intima is hypertrophied; this over-growth is general, but in places pedunculated granulations project into the lumen. The tunica media is perfectly normal. The papilla is intensely infiltrated with an evenly distributed small-celled infiltration (Fig. 4, J), especially in the neighbourhood of the blood-vessels. The adventitia of these vessels is infiltrated, and in places even the media participates. There is dense round-celled infiltration in the *vitreous* just in front of the optic disc (Fig. 4, G G). A section of the optic nerve close behind the lamina cribrosa exhibits the same changes in the vessel walls, *i.e.*, highly inflamed adventitia and intima. The walls of the posterior part of the central artery are not inflamed, but those of the vena centralis are densely infiltrated. The meninges of the optic nerve are not free from the small-celled infiltration (leptomeningitis syphilitica).

In short, there is presented a general syphilitic disease of the arterial walls in the vascular systems of the *iris* and the *arteria* and *vena centralis retinæ*, combined with a small celled infiltration of the tissues, in places generalised, in others accumulated into definite foci. It was remarkable that, almost without exception, the adventitia and intima were diseased, whereas the media escaped. Michel states that in his experience this is typical of syphilitic disease of the walls of blood vessels. The condition is probably preceded by a peri-vasculitis. Michel gives a short account of the views of other ophthalmologists on the subject. The article is accompanied by an excellent coloured plate, and for the convenience of those who wish to consult it, the references (as far as they have been found to correspond with the letters on the diagram) have been included in the text of the abstract. T. HARRISON BUTLER.

XI.—THE OCULAR AND DENTAL STIGMATA OF INHERITED SYPHILIS.

Antonelli and Bonnard.—Rare and complex ocular and dental stigmata of hereditary syphilis. (Stigmates oculaires et stigmates dentaires d'hérédo-syphilis à formes complexes et rares.) *Annals des Maladies Vénériennes*, mai, 1908.

Antonelli and **Bonnard** remark that the relationships between the ocular and the dental stigmata of hereditary syphilis are much more numerous and frequent than would appear from the original and classical conception of Hutchinson's triad. In effect, the ocular lesions which are the most frequent, especially since the discovery by Antonelli of the so-called rudimentary ophthalmoscopic stigmata, are to be found more frequently in the choroid, retina, and optic nerve, under the form of cicatricial or dystrophic lesions than in the cornea, as interstitial keratitis, present or past. Again, the dental stigmata are not limited to erosions, to cuspidian atrophy, especially of the molars, and to Hutchinsonian incisors. Stigmata must be searched for in the whole of the denture, conjointly and separately, in the shape, arrangement, and even the absence of the various dental peculiarities. As to the auricular stigmata, which complete the triad, they are less frequent, and their value is lessened by the anatomy of the ear, most of which cannot be seen and on that account is incapable of manifesting stigmata analogous, for example, to those found in the fundus oculi.

The variety and the complexity of the association between the ocular and the dental stigmata are shown by the following cases :—

(1) A girl, aged 8 years, whose sister is affected with parenchymatous keratitis in full evolution and whose brother presents ophthalmoscopic changes. *Ocular lesions.*—Acute dacryocystitis on the right side, due probably to secondary infection and nasolacrymal osteoperiostitis. The nose is of the "saddle-back" type ; there is chronic rhinitis ; the nasal bones are level with the skin, and the free border and the tubercle feel very prominent (a facial stigma described for the first time by Antonelli). Myopia congenital, or at least dating from the first infancy—7D. in the right and 5D. in the left eye. There exists, therefore, heredo-syphilitic myopia, unequal on the two sides, a finding frequent enough in those who inherit syphilis (Antonelli) Ophthalmoscopically, the left eye shows traces of former papillitis, atrophic plaques of choroido-retinitis, as well as diffuse choroiditis accompanied by pigmentary alterations. The right eye shows analogous changes in the optic disc, no atrophic areas, but a marbling and pigmentation due to dystrophy.

Dental lesions (Bonnard).—Congenital absence of some of the teeth (superior incisors and two temporary molars of the lower jaw). Abnormal placed upper incisors (large gap between the central incisor and the lateral on each side). The general appearance of an edentulous mouth reminded one much more of senility than of a youthful subject as shown by the child's face.

2. A girl of 11 years, was brought on account of recurrent iritis (torpid form) of the right eye. At the age of 5 years the child had suffered from an inflammation of the eyes, probably in the nature of parenchymatous keratitis. On examination, however, the corneæ were found to be perfectly transparent, and free from residual vessels. Ophthalmoscopic investigation showed the presence of simple rudimentary stigmata, especially a dystrophic pigmentation towards the lower periphery of the fundus oculi. *Dental lesions.*—Typical Hutchinsonian upper central incisors. Honeycomb erosions on the six year old molars. Ridged erosions on the free border of the lower incisors.

3. A girl of 15 years, sister of No. 2. *Ocular lesions.*—The left eye is slightly hyperopic, with vision=1. With the ophthalmoscope, it shows a simple diffuse dystrophic pigmentation of the choroid and retina. The right eye is myopic to the extent of 6 D., and, despite correction, vision equals 0.2 only The optic disc is greyish-white, without obvious changes as regards the edge or the vessels. Diffuse dystrophic pigmentation resembling that in the other eye. In sum, congenital monocular myopia, with a subatrophic optic disc (the outcome probably of retro-ocular neuritis), and diffuse dystrophic pigmentation of the choroid and retina in both eyes. *Dental lesions.*—Dwarfed teeth, especially obvious as regards the median central incisors of the upper and lower jaw, the upper canines and the six year molars. Honeycomb erosions evident not only upon the upper and lower molars but also on the canines and the upper median incisors.

4. A man of 32 years. The left pupil was of polygonal shape but reacted well enough to light (no posterior synechiæ). It became almost round during mean dilatation when illuminated by a medium light, and was more or less irregular in outline during myosis. Some pupillary remnants were to be seen on the anterior capsule of the lens in the form of tiny pigmentary deposits. The optic disc was pallid, and the choroid and retina presented a large area of dystrophic pigmentation, especially towards the periphery. The right iris showed a large coloboma, the result of an iridectomy, done thirteen years ago at the Hotel-Dieu. The operation had been necessitated by an injury, which had led to a leucoma adherens. There were fibrinous and pigmentary deposits on the anterior capsule of the lens (the result of iritis). Despite these lesions,

the fundus could be readily examined with the ophthalmoscope. The edges of the optic disc were dull and irregular. There were numerous small *foyers* of choroido-retinitis around the papilla, some being atrophic and others pigmented. Moreover, dystrophic pigmentary changes were present, comparable with those present in the case of the other eye. In sum, leaving on one side the traumatic lesions of the right eye, one found: malformation of the left pupil (discoria and rudimentary remain of the pupillary membrane, probably due to intra-uterine irido-choroiditis; in both eyes rudimentary ophthalmoscopic stigmata in the shape of diffuse dystrophic pigmentation of the retina and choroid, a subatrophic state of the optic disc and especially peripapillary choroido-retinitis of the right fundus. *Dental lesions.*—Polymorphism The central incisors of the upper jaw are massive, amorphous, almost globular, while the lateral incisors are clearly conoid. The first left premolar is very small (microdontism). The right lateral incisor has taken the place of the canine and *vice versâ* (follicular migration or inversion, a very uncommon anomaly.) As regards the inferior maxilla, one observes an anomalous disposition of all the teeth of the anterior third, especially on the right side. Besides, there exists atresia of the anterior third of the same jaw.

THE AUTHORS.

XII.—TRANSPLANTATION OF THE CORNEA.

Plange, O.—On a case of transplantation of the cornea with preservation of transparency. (Ueber einen Fall von Hornhauttransplantation mit erhaltener Transparenz.) *Klin. Monatsbl. f. Augenheilkunde*, März, 1908.

Plange records a case of leucoma in which transplantation of the cornea was crowned with success. A workman who through an injury had already lost the sight of the left eye a long time ago, was unfortunate enough to have his right eye burnt with lime. Symblepharon, entropion, and ulceration of the cornea, with prolapse of the iris, supervened. Thus, the man was completely blind, and the condition of the eye seemed as unfavourable as possible for corneal transplantation. On the other hand, the surgeon was free to make use of the tissues of the left eye, a contingency of the greatest moment. Preliminary operations were directed against the symblepharon and entropion; the conjunctiva of the left eye furnished the necessary material for grafting. In the main operation the knife was used instead of the trephine. Layer after layer of the scar tissue was removed and the cornea thinned as much as was possible without opening the

anterior chamber. Then a flap was dissected out of the left cornea, transferred to the right, and fixed in position with four sutures. The basal layer on which the corneal graft rested, after having been opaque and richly vascularized during the first 12 days after the operation, lost its vessels later on, and became again transparent. In the end the patient counted figures at 4 to 5 metres. It may be mentioned that the left cornea healed quickly, as here, too, care had been taken not to open the anterior chamber.

C. MARKUS.

XIII.—DIABETIC PARALYSIS OF ACCOMMODATION.

Delord, E. and Revel, P.—On paralysis of accommodation in diabetes. (De la paralysie de l'accommodation dans le diabète.) *Archives d'Ophtalmologie*, décembre, 1907.

The subject of diabetic paralysis of accommodation has not attracted much attention, if we may judge from the paucity of references to the subject to be found in literature, ophthalmological and otherwise.

Delord and **Revel** report the following case :—

A female, aged 48 years, has suffered for two or three years from violent migraine, affecting the right side of the head, but not associated with nausea, vomiting, or ocular symptoms. More recently, the patient had experienced breathlessness when going upstairs, as well as an inexplicable general weakness. Diabetes was diagnosed : 150 grammes of sugar were passed in the twenty-four hours. Pruritus of the vulva was present. She was placed on an anti-diabetic regimen, together with the administration of cachets of antipyrin (1·5 to 3 grammes) and sodium bicarbonate. Exactly five days after treatment was commenced, the woman suddenly lost her sight, both for distant and for near objects. When the patient was examined five days later, the ocular media were clear, the pupils active to light, and the fundi normal. R.V. 4/50+3·5 D.sph.=1. L.V. *ibidem.* 0·75 D. of astigmatism in the right eye, as tested with Javal's ophthalmometer. Small words could be read at 25 cm. with a +6 D.sph. glass. Visual fields normal. Glasses were prescribed for distance (+3·5 D.sph.) and for reading (+6 D.sph.). The general condition of the patient improved, and sugar disappeared from the urine. The peculiar point was that vision returned one evening as suddenly as it had been lost a month before. R.V. 2/3 $\frac{+1\cdot0 \text{ D.sph.}}{+0\cdot75 \text{ D.cyl.}}$ Axis 75°=1. L.V.=1 without a glass. With the aid of a +3 D. spherical, the woman was able to read fine print.

SYDNEY STEPHENSON.

XIV.—TUMOURS OF THE CARUNCLE.

Gutmann, A.—Some tumours of the caruncle. (Zu den Geschwülsten der Caruncula lacrimalis.) *Zeitschrift für Augenheilkunde*, Januar, 1908.

Gutmann (Berlin) gives an account of three cases of papilloma of the caruncle and of one of soft fibroma in the same situation. The article is illustrated by some very clear drawings of the histology of the tumours.

The first case was that of a boy, aged 2½ years. He showed a small tumour of the right caruncle, the size of a pea. This was extirpated on January 24th, 1901, but Gutmann could not get a section to examine. On October 7th, 1902, the child appeared again with a similar tumour in the same situation. It was removed, examined, and found to be a benign papilloma, containing hairs, hair follicles, and sebaceous glands.

The second case was in a woman, aged 31 years. She had a small tumour of the caruncle which had been growing for about a year. Latterly, she had had catarrhal irritation of the conjunctiva with some discharge. There was considerable hæmorrhage while the tumour was being removed. It was a very vascular papilloma, and in no place shewed any epithelial downgrowths.

The third patient, a 7 year old boy, had a similar tumour, which had grown larger during the past eight weeks. It also was accompanied by some conjunctivitis. On examination, in addition to the obvious tumours, two small ones were found the size of a pin's head. The main tumour had two roots, one to the caruncle, the other to the plica semilunaris. Microscopic examination shewed the structure to be papillomatous.

Guttmann gives a short account of the literature of these conjunctival papillomata. He does not think that they are caused by chronic irritation ; the accompanying conjunctivitis is the result of the tumour not its cause.

The last case is an example of a different kind of caruncle tumour. A labourer, 21 years old, had noticed a slight hypertrophy at the internal canthus for 1½ years. During the last two months it had grown much faster. There is now a tumour in the inner corner of the right eye as large as two peas. It is pink in colour, has a smooth surface, grows directly from the caruncle, and has a definite peduncle. The caruncle, the plica semilunaris, and the neighbouring conjunctiva were removed. The growth was a soft fibroma, containing a large number of goblet-cells. The prognosis was regarded as good. Gutmann can find only one other recorded case of soft fibroma of the caruncle (Graefe's *Archives*, Band I, 1854).

T. Harrison Butler.

XV.—INTERSTITIAL KERATITIS.

Mohr, M.—Keratitis parenchymatosa. *Pester Medizinisch Chirurgische Presse*, Juni 28, 1908.

Mohr gives statistics of his cases of parenchymatous keratitis in the Adéle Bródy Children's Hospital during the 11 years, 1897 to 1907. The disease occurred in 187 (0.84 per cent.)

of his 22,013 patients. Of these, 90 (48.12 per cent.) were boys, and 97 (51.88 per cent.) were girls. Under one year of age were 2 cases (1.06 per cent.), from 1 to 3 years, 20 (10.6 per cent.), from 4 to 7 years, 68 (36.36 per cent.), from 8 to 14 years, 97 (51.89 per cent.). Eighty-two cases were treated as in-patients. Of these, lues was demonstrable in 78.4 per cent. Pirquet's test has been used during the last 1½ years. The reaction was positive in one case only, which, however, yielded to the inunction cure. Scarlet fever played a *rôle* in the ætiology in 2 cases. In one of these cases it is remarkable that while the disease gave no reaction to Pirquet's test, or to a diagnostic tuberculin injection, and the inunction cure had no success, yet so soon as albumen disappeared from the urine, the keratitis began to improve. In one case of sympathetic ophthalmia with which keratitis parenchymatosa was associated, the latter cleared with the disappearance of the irido-cyclitis, leaving diffuse cloudiness. The most important part of the treatment adopted was the inunction cure, which was used, in children, in doses of 2 grammes, and was well borne. In 3 cases, however, albumen appeared in the urine, and the inunction was stopped. Of the author's 16,016 club-patients in the years 1905, 1906, 1907, 22 (0.14 per cent.) suffered from parenchymatous keratitis, 10 males and 14 females. Of these, 6 were under 10 years of age, 2 between 11 and 15, 6 between 16 and 20, 2 between 21 and 25, and 5 between 26 and 34. Of the last 5, 4 were women, and in these the luetic manifestation dated since marriage, so that keratitis parenchymatosa may occur as a result of acquired lues, after 7 to 14 years. The inunction cure, local treatment, and iodine baths led to cure. The author concludes that the number of malignant cases of this disease are few; in treatment, the chief *rôle*, besides local treatment, is played by mercury; then comes the general dietetic treatment, and, in particular cases, tuberculin injection. In cases of keratitis parenchymatosa occurring after an injury, Mohr gives the workman claiming compensation the benefit of the doubt, and decides in his favour.

ROSA FORD.

INSTRUMENTS AND APPLIANCES.

(1) **Oguchi, Ch.—Experimental studies on the influence of the intensity of illumination on visual acuity and the practical value of the optometer of Hori.** (**Experimentelle Studien ueber die Abhängigkeit der Sehschärfe von der Beleuchtungsentiasikeit und der practische Wert der Photoptomatus von Hori.**) von Graefe's *Archiv f. Ophthalmologie*, Bd. 66, 3, 17 September, 1907.

(2) Coomes, M. F.—The description of a magnet for removing steel from the eye. *Medical Practitioner and News*, October, 1907.

(3) Krusin, F. F.—A glass deviometer. (Ueber ein Scheiben-Deviometer.) *Arch. f. Augenheilk.*, Dezember, 1907, p. 27. Illustrated.

(4) Bartels, M.—A simple phorometer for measuring heterophoria in near vision. (Ein einfaches Phorometer zur Messung latenter Abweichungen beim Nahesehen nebst Bemerkungen ueber den Einfluss ungleichmassiger Akkomodation und der Adaptation der äussen Muskeln auf den Grad der Abweichungen.) *Zeitschrift für Augenheilkunde*, Februar, 1908.

(5) Mayer.—On a box of convex test lenses for verifying strong concave glasses. (Sur une boite de juges convexes destinés à vérifier les verres concaves de forte puissance.) *Ann. d'oculistique*, T. CXXXIX, p. 127, février, 1908

(6) Black, Nelson M.—Method of illuminating test-type charts with artificial light. *Ophthalmic Record*, May, 1908.

(7) Carson, Robert L.—An illuminating eye spud and knife needle. *Journal American Medical Association*, May 9th, 1908.

(8) Post, M. H.—A new knife for dividing membranes obstructing the pupil after cataract operations. *American Journal of Ophthalmology*, May, 1908.

(9) Rhoads, J. N.—An improved instrument to shorten the subjective branch of refraction. *Ophthalmic Record*, June, 1908.

(10) Stewart, Thomas M.—A new trial case. *Ophthalmic Record*, July, 1908.

(11) Snell, Albert C.—An illuminated spud. *Ophthalmology*, July, 1908.

(12) Würdemann, H. V.—Diaphanoscopy of the eye. *Ophthalmology*, July, 1908.

(1) **Oguchi** speaks very highly of the photoptometer of Hori, which is portable and can be adapted to any ordinary lamp. His results are: (1) the acuity of vision is proportionate to the cubic root of the intensity of illumination; but (2) this law does not apply to very weak light (under 0·0026 candle power), when the actual diminution of vision is greater than the formula indicates. R. GRUBER.

(2) **Coomes'** (Louisville) magnet consists of a soft iron core turned at each end in such a way as to form a nipple. The nipples contain perforated screw threads, to which any desired form of electrode may be attached. Two rubber flanges, which go to make up the heads of the spool, have holes so made as to fit snugly around the nipples and firmly against a retaining collar. The coil is adjusted into a frame composed of brass bars. The coil is attached to a block and tackle horse which is fixed to a table placed on rollers, thus ensuring easy and accurate handling of a patient while in a recumbent, a sitting, or a standing position. The cell is wound with a No. 14 silk-covered copper wire continued in two sections. The inside one has a resistance of twelve 6-10 ohms, while the two combined have one of eighteen 6-10 ohms. The coil is energised by a direct theostated current of 110 volts. An incandescent signal lamp is placed in the circuit. The advantages of such a coil are the strength of the magnet, which removes the necessity of introducing an electrode into an eyeball and the surety of polarity and certainty of direction of movement of any contained piece of metal. CHARLES A. OLIVER.

(3) **Krusin's** apparatus consists of a plate of glass on which the angles of deviation are marked off upon ordinates and abscissæ, the centre of the plate being taken as zero. The distance of the patient from the apparatus is 60 cm. (24 in.). The patient fixes a small electric lamp placed in the centre of the plate. The observer sits on the opposite side and moves a small hand lamp along the glass until the image of this lamp reflected from the deviating eye occupies the position corresponding to the image of the central lamp reflected from the cornea of the fixing eye. The position of the hand lamp is then read off upon the glass plate. The manufacturers are Messrs. Dörffel & Faerber, in Berlin. PERCIVAL J. HAY.

(4) **Bartels** finds Maddox's rod and tangent scale a satisfactory instrument for measuring heterophoria in distant vision, but at present there is no reliable method for determining the amount of latent deviation during near vision. He has devised a simple contrivance for the purpose. A tangent scale is attached to a metal plate (15 by 20 c.m.) The zero point is represented by a small hole. The plate is attached by a metal band and clip to a candle, whose flame is just behind the hole. The patient sits at a window so that he can see the scale distinctly and reads off the divergence of the streak of light formed by a Maddox rod placed before one eye. Bartels finds that the deviation of from 3° to 5° is normal. He discusses the general relationship between accommodation and heterophoria.

T. HARRISON BUTLER.

(5) To obviate the difficulty in verifying concave lenses of more than 10 D. by neutralisation with lenses from a test case or by means of spherometers, **Mayer** has had a case made

containing 10 small equiconvex lenses, one for each dioptre from 10 to 20, measuring 17 mm. in diameter and made of glass with a refractive index of 1·52. He claims that with these the corresponding concave lenses can be accurately neutralised.

R. J. COULTER.

(6) **Black** believes that transmitted light for illuminating test-type charts is the best. In support, he says that in using the eyes for distant vision, transmitted light is as near the actual condition under which we work, as reflected light, and that during examination, the light is softer and easier upon the eyes of both the person being examined and the examiner. In order to avoid irradiation, he employs black letters upon a white ground. With his apparatus, the intensity of transmitted illumination may be controlled as perfectly and as easily as with reflected light, while the contrast between black and white is sharper and the letters are more strongly outlined. The variety of test cards to be used may be unlimited, and any desired sized area of chart may be illuminated. The letters are made opaque, so as to be seen absolutely black.

CHARLES A. OLIVER.

(7) **Carson** has devised an instrument which combines a spud and a light. It consists of a handle about five inches in length, through which run electricity-carrying wires to a tiny incandescent condensing lamp placed upon the end of a curved arm. The spud is attached to the corresponding straight end of the handle. By this contrivance a light is thrown upon a field of procedure at such an angle as to bring the spud-tip into the centre of the circle of illumination. CHARLES A. OLIVER.

(8) **Post** (St. Louis) employs a modified form of knife-needle for the division of tough pupillary membranes. The blade, which at its widest part measures $1\frac{1}{4}$ mm., has a length of 6 mm. Its back is straight and dull. A sharply-rounded cutting edge extends the entire length of the blade. A. B.

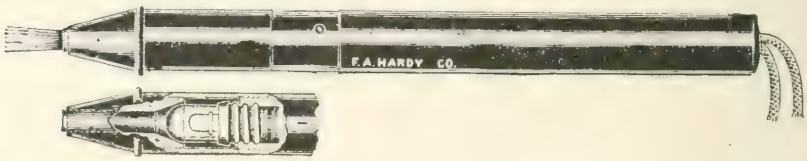
(9) **Rhoads** employs an appliance fitted with three $1\frac{1}{4}$ rings arranged on a handle, and capable of being folded up like a compound magnifying glass. One ring is fitted with *plus* 0.25 D. sph., the second with *minus* 0.25 D. sph., while the third is left unglazed. The instrument (made by J. E. Limeburner and Co., Philadelphia, Pa., U.S.A.) is useful in confirming results after refraction has been approximately worked out. A. B.

(10) The trial case devised by **Stewart** (Cincinnati) presents a few novel features. Thus, the axis of each cylinder is marked by a scratch-line and also by a hole drilled half-way through the glass and then filled with white cement. The case contains, again, nineteen pairs of prisms, one pair each of from $\frac{1}{2}$ to 4 centrads, single prisms on up to 20 centrads. It includes, besides, three cross-cylinders (Jackson). Moreover, three pairs of bifocals (*plus* 1, 2, and 3) cemented to planos are provided. The leather-lined case also includes a California trial frame, an axinometer, a Maddox double prism, and other items. A.B.

(11) The electrically illuminated spud devised by **A. C. Snell** (Rochester, N. Y.) is sufficiently explained by the accompanying

figure. The instrument (made by the Electro Surgical Instrument Company of Rochester, N.Y.) may be boiled. A. B.

(12) **Würdemann** (Milwaukee, Wis.) after touching upon the history of diaphanoscopy as applied to the eye, describes anew his own instrument, shown in the accompanying cut. The instrument is constructed in the main of hard rubber, weighs 30 grammes, is 14 cm. long, and 10 mm. in diameter, and has about the size and shape of an ordinary fountain pen. It is claimed that this little instrument with its miniature five



candle-power lamp and needing less than one volt of electric current, gives as effective a light as "the Brobdingnagian apparatus of Sachs." Another advantage claimed for the Würdemann appliance is that it does not become hot, like the instruments of Leber and Sachs. The author gives very interesting details as to the method of using diaphanoscopy, its limitations, and the results that may be expected from its systematic employment. He believes, indeed, that trans-illumination of the eye "is a necessary adjunct to the dark room examination." SYDNEY STEPHENSON.

CORRESPONDENCE.

Concerning the History of our Knowledge of Pneumococcus-Conjunctivitis.

To the Editors of THE OPHTHALMOSCOPE.

Dear Sirs,

I have just noticed in the March number of THE OPHTHALMOSCOPE (p. 166) a curious chronological misapprehension. In

your article on the pneumococcus you say: "Inoculations of the human conjunctiva have been made by Hauenschild, Gifford, and Veasey. Hauenschild (*Zeitschrift f. Augenheilkunde*, 1900) set up conjunctivitis in his own eye by inoculating the pneumococcus. H. Gifford (*Archives of Ophthalmology*, Vol. XXV, 1896, p. 314) repeated Hauenschild's experiments with pus from a case," etc.

I think that anyone coming across this paradox would be more inclined to think that the date, 1900, was wrong rather than to believe that my work preceded Hauenschild's by some four years. As a matter of fact, my paper contained the first rigorous proof, not only that the pneumococcus could cause the disease, but also that the disease was really contagious.

A paper of Pichler (*Beitrage zur Augenheilkunde*, Bd. 23, S. 311) appeared about the same time (whether a little earlier or later I cannot say) in which he makes a three-line statement that he had succeeded in producing a catarrh of the human conjunctiva with cultures of the pneumococcus; but he gave no further details of his experiments; his paper being concerned primarily with diphtheritic conjunctivitis.

Sincerely yours,

Omaha, Neb., U.S.A.
25th June, 1908.

H. GIFFORD.

BOOK NOTICES.

The Development of Ophthalmology in America, 1800 to 1870: a contribution to Ophthalmic History and Biography. An address delivered in abstract before the Section of Ophthalmology of the American Medical Association, June 4th, 1907. Revised and enlarged by selected portraits and cuts, by ALVIN A. HUBBELL, M.D., PH.D. Professor of clinical ophthalmology in the University of Buffalo, etc., Buffalo, New York. Chicago: W. T. Keener & Co., 1908. Price, $1.75 net.

In the seventy years, the story of which, in regard to ophthalmic medicine and surgery, is instructively and pleasantly given in this little volume, the chief steps in this progress from ancient to modern practice are indicated. Although during the first quarter of the nineteenth century, ophthalmic medicine and surgery were subjects greatly neglected in England and almost of necessity in America, where medical practitioners of high

education were at that period rare, several works of considerable value appeared on the Continent. Amongst these may be cited Demours, Scarpa, Tanizza and Beer, whilst we had little but Wardrop in England and Frick in the United States.

Even in London, as late as the middle of the century, the armamentarium of the surgeon and the therapeutic agents at his disposal were extremely restricted and defective compared with those of which we are at present in possession. Vinum opii, solutions or ointments of silver nitrate or of mercury oxide, varying in strength from one to ten grains in the ounce, a stick of sulphate of copper and some belladonna ointment or plaster, were the chief topical remedies applied by the surgeon, whilst weak solutions of alum and copper sulphate were freely given away. The local treatment was supplemented by general measures, such as decoction of cinchona bark, iron, iodide of potassium, purgatives, and the abstraction of blood by leeches, by cupping, and by venesection, some extraordinary examples of toleration of which were recorded by Lawrence in his "*Venereal Diseases of the Eye.*" Obscure cases, such as amaurosis and glaucoma, were treated with mercury and belladonna. Beer's triangular knife was in general use for extraction of cataract. Removal of the globe was a terrible operation. The only attempt to neutralize errors of refraction was to place in the hands of the patient a set of six or eight convex or concave glasses in a handle common to all, and to permit him to select the pair that suited him best.

But after the middle of the century immense advances, as the result of better knowledge of the anatomy, physiology, and pathology of the eye, and of careful clinical research, are to be observed, and as Dr. Hubbell remarks, a succession of events or stages of progress may be noted which constituted a faithful reflection, and in some instances an improvement on those taking place in general medicine and surgery. At this early period, besides Dr. Frick, to whose treatise on diseases of the eye we have already alluded, Dr. Isaac Hays and Dr. Littell devoted themselves almost exclusively to ophthalmic work, whilst others, as McClellan, Gros, Post, and Agnew, who gained a high reputation for surgical skill, practised it as a subsidiary branch of their art. The introduction of general anæsthesia by Drs. Long, Jackson, and Morton, about the year 1850, greatly facilitated the performance of all operations on the eye, whilst the re-publication of the works of Mackenzie, Middlemore, Lawrence, and of Wharton Jones, showed not only the great variety in the forms of disease presented by the eye, but also the applicability of the lessons to be learned from their study to the other organs of the body, and to the advantages to be gained from appropriate treatment. The institution of special hospitals for diseases of the eye also played an important part in the spread of ophthalmic knowledge. The first infirmary was established in

New London, Conn., by Elisha North in 1817, but it was short-lived. The next was started by Dr. Delafield in 1820, in New York. In 1821, Dr. George McClellan instituted the Philadelphia Hospital for Diseases of the Eye and Ear, which seems to have ceased to exist in 1824. Then followed the Pennsylvanian Infirmary for Diseases of the Eye and Ear, with Drs. George Wood, Isaac Hays, John Bell, and Robert Griffith as surgeons, and Drs. Physic and William Gilson as consulting surgeons. The fifth was the Massachusetts Charitable Eye and Ear Infirmary founded in 1824 by Dr. Edward Reynolds and Dr. John Jeffries. These, with the prosperous Wills Eye Hospital of Philadelphia, and the Montreal Eye and Ear Institution, Canada, the short-lived Baltimore Dispensary for the cure of diseases of the eye, instituted, and apparently officered, by Dr. Frick in 1824, were the chief American ophthalmic institutions.

Each of these hospitals and infirmaries proved highly serviceable, first by giving those in charge large experience in the recognition and treatment of ophthalmic disease, and, secondly, by supplying a place where those who were the subjects of such affections could apply with the certainty that no time would be lost in the application of remedies and that they would obtain the benefit of the highest skill and knowledge.

A second great step in advance in the middle of the century was the discovery that by a special arrangement the details of the fundus of the eye in health and disease, optic disc, and retinal vessels, and choroid could be distinctly seen, as well as many pathological conditions of the retina. This, for which we are mainly indebted to the genius of Helmholtz, although the instrument he used has undergone many modifications and improvements, opened up an entirely new field of research, which has been diligently cultivated, and has facilitated the diagnosis of what were the most obscure and unsatisfactory of the affections of the eye.

Of an importance scarcely inferior to that of the ophthalmoscope were the results of the long and carefully executed series of researches by Donders on the refraction of the eye. The prescription of appropriate lenses to correct errors of refraction, founded upon those researches, now occupies a large proportion of the time of the surgeons in every ophthalmic hospital and the good results can hardly be overestimated.

The last to be mentioned is the great movement in surgery effected by Lord Lister, which need only to be referred to in this place, since its effects are traceable through the whole circle of medical and surgical activity and are familiar to all.

The work is embellished by prints from photographs of some of the pioneers of ophthalmology, many of whose names are well known and held in high estimation in this country. Amongst these are Dr. George Bethune, Dr. Isaac Hays, Dr. Squien

Littell, Dr. Elisha North, Dr. Philip Syng Physic, Dr. George McClellan, Dr. John Kearney Rodgers, Dr. Edward Delafield, Dr. Edward Reynolds, Dr. John Jeffries, Dr. Nathan R. Smith, Dr. Samuel D. Gross, Dr. Alfred C. Post, Dr. John H. Dix, Dr. D. Hayes Agnew, Dr. William E. Horner, Dr. W. T. C. Morton, Dr. John Collins Warren, Dr. Henry W. Williams, Dr. Elkanah Williams, Dr. Adenell Hewson, Dr. Edward Hartshorn, Dr. Edward Holmes, Dr. Henry D. Noyes, Dr. Hasket Derby, Dr. Hermann Knapp, Dr. Freeman J. Bumstead, Dr. Cornelius, and Dr. Agnew.

The Extra Pharmacopœia of Martindale and Westcott. Revised by W. HARRISON MARTINDALE, Ph.D., F.C.S., and W. WYNN WESTCOTT, M.B., Lond, D.P.H. Thirteenth edition. London: H. K. Lewis, 136, Gower Street, W.C. 1908. Price 10s. 6d. net.

There are a few books, and the *Extra Pharmacopœia* is emphatically one of them, which no practitioner of medicine can afford to be without. The thirteenth edition of this wonderful compilation has recently been issued from the press. The first edition, published in the year 1883, contained 313 pages and 1,600 items in the index. The thirteenth edition (1908) contains 1,203 pages and about 10,000 items in the index. The present issue has undergone thorough revision, and space has been made for an ever increasing amount of information by re-setting in smaller type some of the less important contents. Although it contains 128 pages more than its immediate predecessor, yet the present volume is thinner than the last-named, since a different paper has been employed. The range of subjects dealt with by the *Extra Pharmacopœia* is really astonishing. Not only does it take up drugs of all kinds and their therapeutic applications, but also vaccines and antitoxins, animal organotherapy, poisons and antidotes, analytical memoranda, bacteriological notes, mineral waters, notes on health resorts, and includes besides an excellent section on radiology. Amongst items of particular interest to ophthalmic surgeons we may mention unguentum flavum which, according to the *Extra Pharmacopœia*, should be prepared with the mercuric salt in a freshly precipitated moist state; the introduction of the acetyl grouping into the sodium salt of p-amino-phenyl-arsenic acid; the question of the injection of the soluble and insoluble salts of mercury; scopolamine-morphine anæsthesia; the antiseptic value of the various silver compounds; and the Calmette reaction. Indeed, the ophthalmic surgeon will find in the *Extra Pharmacopœia* information upon practically every remedy and method that has been used in eye work. It is literally a *vade-mecum* of the handiest possible description.

Ophthalmic Surgery. A handbook of the surgical operations on the eyeball and its appendages as practised at the clinic of Prof. Hofrat Fuchs. By Dr. JOSEF MELLER, Privat-docent and First Assistant K.K. II University Eye Clinic, Vienna. The translation reviewed by WALTER L. PYLE, A.M., M.D. 118 original illustrations. London: Rebman, Limited, 129, Shaftesbury Avenue. 1908. Price, 12s. 6d. net.

This attractive-looking and well-illustrated book is based upon lectures on ophthalmic surgery given by Dr. Josef Meller at the *Klinik* of Professor Fuchs, in Vienna. It may be taken to represent the more important operations on the eye as they are carried out at the great Vienna institution. It is published in response to requests from American and British practitioners who have attended Dr. Meller's lectures.

Meller advocates the claims of local as opposed to general anæsthesia. Indeed, general anæsthesia with scopolamin and morphin is recommended in preference to narcosis by ether or chloroform. As local anæsthetic, cocaine, 3 per cent., is advocated, and if the eye be injected, adrenalin is used just before the operation. Alypin, 3 per cent., is preferred to cocaine for some purposes, as probing and the removal of foreign bodies from the cornea, since it causes no local inconvenience, as does cocaine, by dilating the patient's pupil. It is also preferred to cocaine for rendering the eye anæsthetic before iridectomy for glaucoma. For operations on the eyelids, the subcutaneous injection of cocaine, 1 per cent., will usually suffice.

Twenty-three pages are devoted to the lacrymal sac, which Meller resects by a method of his own. The indications for the operation are numerous. Excision of the palpebral lacrymal gland is particularly indicated when removal of the sac has proved inadequate to cure watering of the eye. Meller does not slit the lower canaliculus, as customary in this country, before passing lacrymal probes. The tiny orifice is simply dilated by means of a conical probe. The passage of Bowman's probes is much facilitated by the previous use of cocaine—adrenalin solution passed into the duct by means of an Anel's syringe. The employment of the lacrymal probe is contraindicated in acute inflammatory conditions, as well as in cases of tuberculosis, where the diseased sac should be extirpated. Mellor's experience leads him to believe that most cases of trichiasis will yield to the operations devised by Anagnostakis and Panas respectively.

It may be noted in passing that in Fuchs' *klinik* operations for strabismus are performed only on children who have passed their twelfth or thirteenth year. Before that, squint is treated by the constant use of glasses, and by exercise of the deviating eye by systematic bandaging of the healthy eye. Stereoscopic exercises are also adopted in such cases.

Speaking of enucleation of the eyeball, Meller rightly insists that not a particle of conjunctiva should remain attached to the bulb, inasmuch as "every millimeter is of the greatest importance for the wearing of a prothesis." The difficult part of the operation for a tyro is the division of the optic nerve. The nerve can scarcely be missed provided a knowledge of its position has been acquired "by slow groping about with the closed scissors." But should the eye be rotated obliquely instead of directly inwards or outwards, and should the surgeon under such circumstances hastily make a cut "anywhere backward in the orbit," he will assuredly miss the nerve. It is not necessary to employ sutures after removal of the eye, since the conjunctiva will naturally fall into the best position, and the wound will heal in the course of a few days. Meller advocates enucleation when panophthalmitis is developing, although if panophthalmitis be already an accomplished fact, that operation is contraindicated. In such an event the proper procedure is to evacuate the pus by means of an opening in the anterior portion of the eyeball. Mules's operation is not performed in Fuchs's *klinik*. Optico-ciliary neurotomy, however, finds an indication in blind glaucomatous eyes that have become painful.

The description of operations for cataract, senile and otherwise, which extends to upwards of fifty pages, is illustrated by cuts made from photographic views, intended to show faithfully the position of the operator and assistant's hands during the various procedures. The speculum is dispensed with. Forceps are employed for opening the anterior lens capsule. That instrument, although not quite so easy to use as the cystotome, has the advantage of making a large opening in the capsule directly in the pupillary area, with the consequence that the capsule cannot produce interference with sight later on. Besides, the free opening brings cortical remains freely into contact with the aqueous humour, thereby facilitating their absorption. Apart from the æsthetic standpoint, Meller believes that no sound argument can be advanced in favour of the so-called "simple" extraction of cataract—that is to say, extraction without iridectomy. The operation may be undertaken, however, if it be certain that the patient will rest quietly in bed afterwards. Hence, it should never be performed in very old people or if the patient suffers from a cough. It may sometimes be permissible if there be good vision in the other eye. Certain conditions of the eye should also be present before one undertakes simple extraction. Such are uncomplicated cataract, large pupil, small lens nucleus, and, in particular, no tendency of the iris to prolapse. A small tenaculum is to be preferred to the forceps for opening the capsule when the pupil is narrow. The incision for simple extraction should be made exactly at the limbus. On the day following operation, if the pupil be not perfectly circular, the wound is re-opened and the iris resected. Meller advises that this be done

even if the iris does not lie directly in the wound. Excision of the prolapsed iris, however, is generally difficult, since the eye does not react very well to cocaine. It is, under any circumstances, an unpleasant alternative.

A couple of comprehensive chapters deal with operations, new and old, for glaucoma. In iridectomy the incision is usually made with a keratome. The Graefe knife, however, is employed under several conditions, which are summarized by Meller as follows:—1. If the anterior chamber is very shallow; 2. If the pupil is dilated; 3. If the cornea be so opaque as to preclude the operator from seeing the course taken by the knife; and 4. In restless subjects. de Wecker's anterior sclerotomy yields good and permanent results, provided it be adopted only in cases where tension has risen after the performance of iridectomy. The operation, if necessary, may be repeated several times on one and the same eye, and the incision may be made at any favourable point in the sclera lying at least 1mm. to 1.5mm. from the limbus. Posterior sclerotomy is recommended as a preliminary operation in cases where iridectomy is technically impossible. In most instances iridectomy may follow at once upon the sclerotomy. There is no mention of Lagrange's operation for glaucoma, the so-called "irido-sclerectomy." On the other hand, a good description is given of Heine's "cyclodialysis"—that is to say, the division of the ligamentum pectinatum, accompanied by the opening of the angle of the anterior chamber and the detachment of the ciliary body and iris from the adjacent sclera. Briefly, a 2mm. incision is made with the cutting edge of a keratome through the lower part of the sclera at a distance of 5mm. from the limbus and parallel with it. A spatula is next passed through the wound between the sclera and the ciliary body until its extremity is seen below in the angle of the anterior chamber. By slight lateral movements of the spatula, the ciliary body is next detached from the sclera; and provided the operation has been performed properly, the aqueous humour does not escape from the eye, nor does bleeding take place into the anterior chamber. Lastly, the spatula is withdrawn from the wound, the conjunctiva sutured, and the eye bandaged. The effects of cyclodialysis attain their highest degree one to three days after operation. In about 30 per cent. of the cases tension is permanently reduced; in about 40 per cent. merely a temporary reduction in tension occurs; while in about 30 per cent. tension remains uninfluenced. The most frequent complication of Heine's operation is detachment of Descemet's membrane from the cornea. Cyclodialysis is to be regarded as a valuable preliminary to iridectomy. It is also of service when iridectomy fails or is contraindicated.

The translation reads smoothly, and has evidently been made and revised with care. Printers' blunders are few and far

between. But "faculty" on page 202 should read "faulty," "stimultaneous" on page 184, "simultaneous," and "or" on p. 71 "of." A specially bad example of so-called "split infinitive" on page 213 ("an attempt may be made to at least partly draw the conjunctiva over the defect") should find no place in the next edition.

Meller's book may be confidently recommended to readers of THE OPHTHALMOSCOPE. SYDNEY STEPHENSON.

E. Merck's Annual Reports. Complete Series. Volume XXI, 1907. Darmstadt, May, 1908.

Merck's *Annual Report*, indispensable to all who are interested in new remedies or in new applications of old ones, has lately reached us. The book is in no sense a mere advertisement, but evidently the expression of an honest desire to furnish readers with a brief and impartial review of the therapeutic acquisitions of the last twelve months. Impartiality is written large on every page of the publication, which is sent free to medical men on application to Merck's London Office, at 16, Jewry Street, E.C. Among the newer remedies applied in ophthalmology we note picric acid ointment (2 per cent.) in burns of the eyes, due to fire or to chemical substances; pyraloxin in chronic conjunctivitis; acetate of silver in the prevention of ophthalmia neonatorum; thiosinamin in leucomata; gelatine injections in aneurism of the ophthalmic artery and in retinal hæmorrhages; iothion ointment in blepharitis and in scrofulous eye troubles in children, as well as in vitreous hæmorrhage, choroiditis, iritis, and atrophy of the optic nerve; perhydol (pure $H_2 O_2$) in affections of the cornea; euphorin powder in obstinate ulcers of the cornea and chronic ophthalmia; and, lastly, Deutschmann's new universal serum in such conditions as infected wounds of the eye, hypopyon-keratitis, irido-cyclitis, and sympathetic inflammation.

NOTES AND ECHOES.

Appointments.

SIR WILLIAM J. COLLINS has been appointed senior ophthalmic surgeon to the amalgamated Hampstead General and North-West London Hospitals. Dr. J. V. Troitsky has been nominated professor of ophthalmology in the University of Charkow. Dr. Antonelli, of Paris, has been nominated chevalier of the French Order of the Legion of Honour. Congratulations to this distinguished correspondent of THE OPHTHALMOSCOPE! Professor Uhthoff has been appointed Rector Magnificus of the University of Breslau for the session 1908-1909. Dr. Karl Hoor

(Klausenburg) has been appointed director of the new second eye klinik in Budapest. Dr. Walter Thorner has been recognised as *Privat-docent* of ophthalmology in Berlin; Dr. Gustav Freytag in Munich; and Dr. Franz Krusius in Marburg. Dr. Ulysses S. Smith has been appointed attending oculist and aurist to the Levering Hospital, Hannibal, Missouri.

* * * *

Honorary Degrees.

DURING the recent meeting of the British Medical Association in Sheffield, honorary degrees in the Faculty of Science were conferred by the University of Sheffield upon three of our number, namely, Mr. Simeon Snell, Sir Henry R. Swanzy, and Professor Fuchs. Upon the 350th anniversary of the foundation of the University of Jena, an honorary degree was conferred upon Dr. Alva Gullstrand, professor of ophthalmology in Upsala. The degree of LL.D. has been bestowed upon Dr. L. Webster Fox, of Philadelphia, by Dickinson College, Carlisle, Pa., U.S.A.

* * * *

Mr. Jonathan Hutchinson.

UPON July 28th last Mr. Jonathan Hutchinson whose name has been rendered famous by his discoveries in the realm of ophthalmic medicine and surgery, attained his eightieth birthday. Amongst the numerous congratulatory messages received by Mr. Hutchinson on this occasion was one from the President and Vice-Presidents of the Royal College of Surgeons of England, a corporation of which Mr. Hutchinson was formerly himself President. Mr. Hutchinson as a Trustee of the Hunterian Collection, still retains an official connection with the College.

* * * *

Ophthalmological Society.

THE Council of the Ophthalmological Society of the United Kingdom submitted to the members at the last annual general meeting, held on July 10th, 1908, certain suggestions with a view to the admission of foreign medical men. Briefly, it was suggested that such medical men be proposed and balloted for in the same way as ordinary members, and that the subscription should be one guinea per annum, without entrance fee. This liberal proposal was somewhat marred by certain restrictions; 1. that the so-called "foreign members" were debarred from taking any part in the management of the affairs of the Society; 2. that they should not be eligible for any office in the Society; and 3. that they should not be entitled to vote at any general meeting.

After discussion, the meeting resolved to take no immediate action in regard to the admission of foreign members, and to

defer further consideration of the Council's suggestions until the next annual meeting. We trust that the calm reflections of the next twelve months may infuse the Council's suggestions with a wider spirit of liberality towards their foreign *confrères*. The French and German Ophthalmological Societies make no such restrictions upon their foreign members as those unwisely proposed by the Council of the Society of our own country.

* * * *

British Medical Association.

THE seventy-sixth annual meeting of the British Medical Association held at Sheffield, Yorkshire, will be memorable in the minds of the ophthalmic surgeons, since this is the first occasion that one of their number, Simeon Snell, D.Sc., J.P., F.R.C.S.Edin., has occupied the presidential chair. The new president is the son of a West Country surgeon. He was

THE NEW PRESIDENT.

Barraud Photo. *Dawson Block*

educated at Mannamead School, Plymouth, and received his medical education at Leeds, Guy's Hospital, London, and the Royal London Ophthalmic Hospital. He settled in Sheffield soon after he became qualified, and for several years was lecturer on anatomy in the local medical school. He was appointed ophthalmic surgeon to the Royal Infirmary, and his work in our speciality is known the world over. He took a large and honourable share in obtaining a charter for the founding of the

Sheffield University, where he is now professor of ophthalmic medicine and surgery. It is gratifying to note that the Council of the British Medical Association has awarded to Mr. Snell the Middlemore Prize for 1908 in recognition of his contributions to ophthalmic science.

* * * *

Section of Ophthalmology British Medical Association, 1908.

THE Section of Ophthalmology, under the presidency of Sir Henry R. Swanzy, assembled on July 29th, 30th, and 31st last, at Sheffield University. The greater part of the first morning was occupied by a discussion on "The relation of disease of the Nasal Accessory Sinuses to diseases of the Eye," which was opened from the anatomical point of view by Dr. Logan Turner (Edinburgh), and from the clinical side by Dr. George Mackay (Edinburgh). The following gentlemen took part in the discussion:—Syme (Glasgow), Greene (Norwich), Axenfeld (Freiburg), Bronner (Bradford), Fuchs (Vienna), Watson Williams (Clifton), St. Clair Thomson (London) and Stephenson (London). A communication by Professor Fuchs (to be published in the next number of THE OPHTHALMOSCOPE) on "The causation of Glaucoma subsequent to Leucoma Adhærens," and one by Inglis Pollock (Glasgow) on "Monocular Diplopia" brought the proceedings on the 29th to a conclusion. On the following day Professor Axenfeld (Freibourg) opened a discussion on "Serum Therapy in diseases of the Eye," and gave an admirable summary of the present state of our knowledge upon that subject. The president, Percival J. Hay (Sheffield), Johnson Taylor (Norwich), Mackay (Edinburgh), Peel Ritchie (Edinburgh), N. B. Harman (London), Pollock (Glasgow), Hern (Darlington), Fuchs (Vienna), Ormond (London), and Lee (Liverpool) took part in the discussion, the interest of which was well maintained throughout, and Professor Axenfeld replied. A series of cases was then shown by Col. H. Herbert to illustrate his paper, "Filtering Cicatrices by two methods." The cases excited great interest, and seemed to bear out Herbert's views. Lt.-Col. F. P. Maynard made a communication dealing with the seasonal prevalence of acute glaucoma, which we hope to publish in these columns in due course. The last discussion, "Colour Vision and its anomalies" was introduced by Dr. F. W. Edridge-Green, and in connection with this discussion Tomlinson showed and described his nernst lamp spectroscope, an ingenious appliance for producing any portion of the spectrum at will. The resulting discussion was a lively one, and the following gentlemen took part in it:—Cecil Shaw (Belfast), C. D. Marshall (London), Greene (Norwich), Pridmore, Maynard, and Harman. Dr. Thomson Henderson gave a most instructive

lantern demonstration dealing with the anatomical factors in the pathogenesis of glaucoma. Some really beautiful slides prepared by the Lumière colour process were thrown upon the screen. The proceedings ended with a paper by A. F. MacCallan dealing with the ophthalmic conditions in the Egyptian Schools, which we shall publish *in extenso* in THE OPHTHALMOSCOPE. Disappointment was generally expressed that for some obscure reason a communication by Major Henry Smith, of Jullundur, Punjab, India, dealing with "The treatment of immature Cataract," was not read, although the Section had time on its hands. The communication, however, had been already read at the annual meeting of the American Ophthalmological Society on July 16th, 1908, and has since been published in the *Lancet* of August 15th, 1908.

* * * *

A Remarkable Gathering.

THE luncheon given by Mr. Simeon Snell on July 30th at the Royal Infirmary, Sheffield, to some sixty guests, was memorable from several points of view. Mr. T. Pridgin Teale, F.R.S., had come from his retirement to honour the host, who had been one of his most promising pupils in years gone by. With the same end in view, the veteran Dr. D. Argyll Robertson had journeyed from Jersey, where he is spending his well-earned retirement. Professor Fuchs, of Vienna, and Professor Axenfeld, of Freiburg, were also present. The Chairman of the Infirmary Committee, Mr. John Marshall, testified to the esteem in which Mr. Snell was held by those who control the destinies of one of our most important provincial medical institutions. Not the least touching feature of the gathering was the presence of Mr. Michael A. Teale, son of the veteran Teale, and of Mr. Snell, son of the President of the British Medical Association. After lunch the guests were photographed together.

* * * *

American Ophthalmological Society.

DOCTORS SAMUEL B. ST. JOHN, of Hartford, Connecticut, Samuel Theobald, of Baltimore, Maryland, and William M. Sweet, of Philadelphia, have been elected President, Vice-President, and Secretary respectively of the American Ophthalmological Society for the ensuing year. The next meeting of the Society will be held in New London, Connecticut, in July, 1909.

* * * *

The Alvarenga Prize.

DR. WILLIAM T. SHOEMAKER, of Philadelphia, Pa., U.S.A., Editor of our esteemed contemporary, the *Annals of Ophthalmology*, has been awarded the Alvarenga Prize of the College of Physicians of Philadelphia, for his essay upon "Retinitis Pigmentosa."

* * * *

New York Eye and Ear Infirmary.

PLANS to enlarge the New York Eye and Ear Infirmary building, which is situated in New York City, New York, U.S.A., have been filed. The improvements will cost about five thousand dollars.

* * * *

New York Optometry Bill.

ON May 27th last Governor Hughes signed the New York Optometry Bill, whereby the existence of the sight-testing optician is recognized and legalised. A State Optometry Board of five members has been appointed for the purpose of examining candidates and of giving them a license to pursue business. The practice of optometry is defined as "the employment of any means, other than the use of drugs, for the measurement of the powers of vision and the adaptation of lenses for the aid thereof." It is stated (more's the pity!) that New York is the thirteenth State to adopt such a Bill.

* * * *

International Congress of Ophthalmology.

IN order to honour the memory of de Vincentiis, who founded the Naples Eye Hospital, it is announced that the XI International Congress of Ophthalmology which assembles at Naples from the 2nd to the 7th of April, 1909, will assign six gold medals (*Primeo de Vincentiis*) to the authors of the six most valuable articles dealing with opthalmology. The essays must not have been published elsewhere. Communications, which should be typewritten, must be presented not later than October 31st, 1908.

* * * *

Congress of Typhlology.

FROM March 30th to April 3rd, 1909, the International Congress of Typhlology will assemble at Naples, where another International Congress, that of Ophthalmology, will hold its sittings from April 2nd to April 7th, 1909. The members of the latter

are invited to attend the meeting of the former, and a combined session is proposed for the purpose of discussing the following official subject: "Whether it be advisable in the treatment of patients afflicted with diseases immediately conducive to blindness, to give them correct information as to the precarious condition of their sight and such instruction as may be necessary to them when blindness overtakes them."

* * * *

Conference on the Blind.

THE second triennial International Conference on the Blind was held in Manchester, England, only the other day. The social conditions of the blind, including questions of housing, training, education, and recreation, were in the main dealt with, but time was also found for a discussion as to the preventive treatment of ophthalmia neonatorum. Miss Winifred Holt (New York) described the steps taken in the State of New York by the Commission of Enquiry, to which attention has been drawn on more than one occasion in the columns of THE OPHTHALMOSCOPE. A 1 per cent. solution of silver nitrate was recommended for prophylactic use, and it was further suggested that such a solution, contained in small glass receptacles, should be provided free to medical men and to midwives by the Health authorities. Immediate notification of a baby's inflamed eyes was also advocated. It seems something of a pity that no details appear to have been furnished to the Congress of the Liverpool experiment in the treatment of ophthalmia neonatorum, whereby, owing to the co-operation of the Health authority and the St. Paul's Eye and Ear Hospital, mother and affected baby are, whenever possible, removed without loss of time in a City ambulance to a special ward in the last-named institution. The work is rendered possible by two recent Acts of Parliament, namely, the Midwives' Act and the Notification of Births Act. It will be remembered that under the latter Act the Medical Officer of Health receives notification of all births within thirty-six hours. Apart from ophthalmia neonatorum, the Congress dealt with some other interesting points, notably with the so-called "sixth sense," with the possession of which many blind people are credited. Mr. W. H. Illingworth, principal of a Manchester Institution for the Blind, believed that this sense of obstacles, as it has been described, really existed, and that it was in some way connected with electricity. He rejected the suggestion that the sixth sense was due to a subtle combination of touch and hearing. On the authority of Miss Isabel Heywood, founder of the Manchester and Salford Blind Aid Society, it was stated that the United Kingdom included among its population 34,000 blind persons.

* * * *

Suicide from fear of Blindness.

An inquest was recently held at Bethnal Green, London, E., on the body of a man suffering from cataract who had taken his own life. The coroner, Dr. Wynn Westcott, stated that a large number of people similarly afflicted committed suicide rather than face the horrors of blindness for the rest of their days. "Having seen the green fields," the coroner continued, "they did not like to be shut out."

* * * *

Obituary.

The death is announced, at the age of 43 years, of George L. B. Smith, assistant to the Eye, Ear, and Nose Clinic at the Polyclinic Medical School and Hospital, New York City, U.S.A. Dr. James A. Lydston, a Chicago ophthalmologist, died on July 6th at the age of 47 years. Dr. Bolling A. Pope, one of the best-known ophthalmic surgeons in the southern parts of the United States of America, died at New Orleans, Louisiana, on July 19th last, aged 42 years. Dr. Augustus H. Wurtele, of Philadelphia, Pa., died on July 21st, aged 38 years. The death is announced on August 14th of Dr. Alexander Macdonald, ophthalmic surgeon to the New Town Dispensary, Edinburgh.

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CONTENTS.

Original Communications—

1. Professor Ernst Fuchs.—Glaucoma in consequence of Cicatrix of the Cornea with Anterior Synechia (leucoma adhærens) 742

2. Thomson Henderson, M.D.—Anatomical factors in the pathogenesis of Glaucoma 746

Clinical Memorandum—

1. Charles Wray, F.R.C.S.—Ptosis treated by Cautery 767

Novelties—

1. H. Beale Collins, D.P.H.—Noah's Ark Test-Types 768

Translation—

1. Dr. Félix Lagrange.—On simple Sclerectomy in chronic, simple Glaucoma 770

Review—

1. Sydney Stephenson.—Some of the Newer Remedies in Eye Work (*concluded*) 776

Current Literature—

I. Irido-Cyclitis 799
II. Self-mutilation of the Eyes 804
III. The origin and development of Trachoma 805
IV. The effects of ultra-violet light upon the Eyes 806
V. Congenital Word-Blindness 808
VI. The Couching Operation for Cataract 811
VII. Detachment of the Retina 813
VIII. Optic Atrophy and general Obesity 815
IX. Neuropathic Keratitis 816
X. The Exophthalmos of Acromegaly 817
XI. Simple anterior Sclerectomy in Glaucoma 818
XII. A new Symptom-Complex 820
XIII. The paintings of Colour-Blind Artists 820
XIV. Extirpation of the Superior Cervical Ganglion of the Sympathetic Nerve 822
XV. The eyes of Epileptics between the Attacks 823
XVI. Glaucoma 824
XVII. Xeroderma Pigmentosum 831
XVIII. Myopia 833
XIX. Remedies... 838

Book Notices 843

ORIGINAL COMMUNICATIONS.

GLAUCOMA IN CONSEQUENCE OF CICATRIX OF THE CORNEA WITH ANTERIOR SYNECHIA (LEUCOMA ADHÆRENS)*.

BY

PROFESSOR ERNST FUCHS,

VIENNA, AUSTRIA.

I propose in the present paper to draw attention to a very common condition, namely, cicatrix of the cornea with anterior synechia, or leucoma adhærens. This condition very often gives rise to increased tension, a result that is generally admitted to be due to obliteration of the angle of the aqueous chamber. Specimens of such cases, in fact, always exhibit this obliteration as an established condition, but they do not teach us how the obliteration is brought about, or whether it existed previous to the hypertonia or followed in consequence of it, and why the obliteration is present in some cases and yet absent from others.

In order to elucidate these questions, I have examined a considerable number of cases in an early stage; cases of deep corneal ulcer before and immediately after perforation, besides specimens of recent cicatrix with anterior synechia, excluding, however, all cases with increased tension.

In ulcer of the cornea, previous to perforation, the angle of the aqueous chamber is widely open and often filled with lymph. In three of my cases there existed at one point in the angle a union between the anterior iris surface and the posterior surface of the ligamentum pectinatum. This localised adhesion did not produce an obliteration of the angle, but only shut it off from the rest of the anterior chamber (Fig. 1). This seclusion is brought about by a circumscribed prominence of the pectinate ligament, due to local infiltration, coming into contact with another prominent point on the anterior aspect of the iris. As regards the anterior iris surface, I would point out that in sections which pass through one of the peripheral iris crypts, there is scarcely any iris tissue in front of the epithelial pigment layer, and therefore here the iris root appears very thin. A little further away from its root, the iris at once assumes its full thickness, so that at the point where this takes place, the iris base projects as a kind of circular fold into the aqueous chamber. It is this point which, in the event of the iris becoming swollen, meets the above-mentioned prominence of the ligamentum, and so may

* A communication read in the Section of Ophthalmology at the annual meeting of the British Medical Association at Sheffield, July 29th, 1908.

To illustrate Prof. Fuchs' communication.

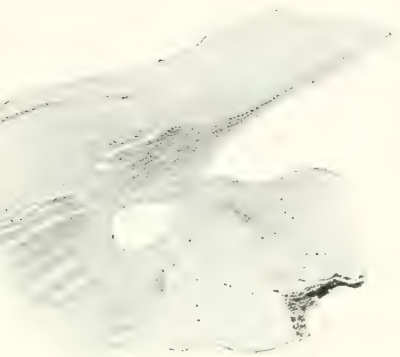

Fig. 1.

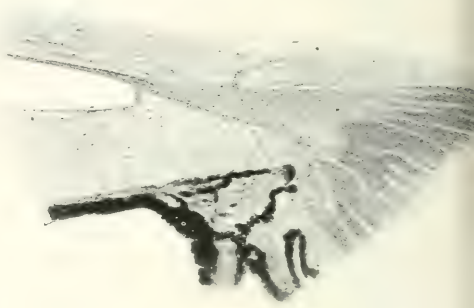

Fig. 3.

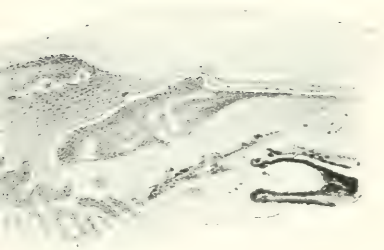

Fig. 2.

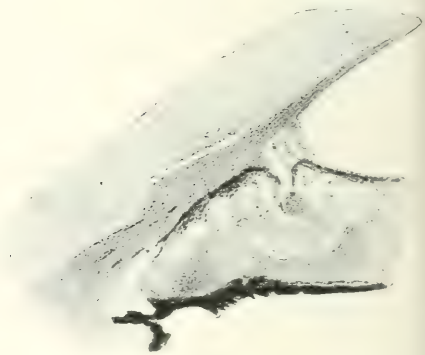

Fig. 4.

become definitely attached to it, in which case the angle proper of the aqueous chamber is secluded, so as to form a ring-shaped canal. This condition was first pointed out by Priestley Smith as a consequence of the advancement of the iris in glaucoma, where it may precede the full obliteration of the angle. It may, however, occur just as well after inflammatory swelling, as in cases of iritis accompanying ulcer of the cornea or in any other kind of iritis. If the swelling be intense, the aforesaid ring-shaped seclusion of the angle may pass into complete attachment of the iris to the posterior surface of the ligamentum.

In ulcers of the cornea not followed by perforation, the angle of the aqueous chamber will ultimately become free again. This, however, is not the case after perforation. After evacuation of the aqueous humour the advancing iris comes into contact with the cornea, now separated from it only by a capillary layer of lymph, though even then the proper angle of the chamber may be preserved as a ring-shaped space filled with lymph (Fig. 2). The seclusion of this space is favoured by the fact, that after perforation the cornea sinks back and this gives rise to a ring-shaped fold on its posterior surface, corresponding more or less to the edge of Descemet's membrane. This projecting fold is the first point which comes into contact with the advancing iris, so as to shut off the angle of the chamber, thereby preventing the lymph escaping from it.

In most cases after perforation the iris is intimately applied to the cornea throughout its whole extent; in many cases the iris may be said to be gently pushed against the cornea, so as to exhibit on its anterior surface the impressions of the ligamentum and on its posterior surface the impressions from the ciliary processes. This is by no means due to increased pressure as in glaucoma, for it occurs in eyes with quite recent perforation. I presume that as the aqueous humour escapes after the perforation from the posterior chamber, the ciliary processes must advance to the iris, and may even be pushed forward by the advancing vitreous body. When we remember, too, that evacuation of aqueous is always followed by hyperæmia of the iris and ciliary body, and that these structures are, as a result of ulceration of the cornea, already in a state of inflammatory swelling, it is obvious how the ciliary processes after perforation may, in consequence of the increased hyperæmia, in a still further degree press upon the iris root.

The application of the iris to the cornea, which follows the escape of the aqueous, may remain as such or may proceed to adhesion, in which case the endothelium of the cornea and iris is stripped off, and the two surfaces either unite directly or by the interposition of a very thin layer of new tissue. The ultimate result, after healing of the ulcer and restoration of the chamber, will depend on this.

In order to ascertain the final condition of the eye after the healing of a perforating ulcer, I examined both recent and old-standing cases of cicatrisation after perforating ulcers of the cornea with anterior synechia. I excluded all eyes with ectatic cicatrices or in which there had been any increase of pressure and examined only such eyes as presented solid and flat cicatrices with partial anterior synechia and normal tension. Of these specimens I could not collect more than nineteen, because such eyes do not require enucleation and therefore are rarely obtainable for examination. Some of these eyes came from the *post-mortem* room.

Now of all these nineteen cases one only exhibited an open angle throughout the whole circumference of the anterior chamber. In all the other cases the angle was altered at that part of the circumference corresponding to the anterior synechia, while in some of the cases other parts also of the circumference were affected.

Let us consider first the region corresponding to the synechia. Here there was generally complete obliteration of the angle, although in a few cases this was merely an attachment which left free a peripheral ring-shaped canal. The extent of the adhesion depends chiefly on the position of the synechia. If this be situated near the margin of the cornea, the portion of the iris from its origin up to the synechia is in its whole extent tied down to the cornea. If the synechia comprises only the pupillary border, the peripheral attachment usually extends only up to the edge of Descemet's membrane, the part of the iris between this and the synechia being free and stretched between the two points of attachment, like the chord of an arc formed by the cornea.

In those parts of the circumference of the iris which do not correspond to the anterior synechia, the angle of the chamber behaves differently. In the majority of cases (13 of the 19 cases), the angle exhibited a normal condition ; in the other six cases it was altered. There existed either a localised union between iris and cornea, so as to leave open the ring-shaped peripheral space, or, in most of the cases, the adhesion was complete from the root of the iris to the margin of Descemet's membrane (Fig. 3). There is a marked difference between those cases of anterior synechia followed by hypertonia and those in which the tension had not risen above normal, for in these latter cases there is no trace of atrophy or compression of the iris, but, on the contrary, the iris usually presents evidence of stretching or tearing off from the cornea (Fig. 4).

The varying condition of the angle in the different parts of the circumference of the chamber depends on the action of the sphincter pupillæ. When the anterior chamber begins to re-form, the sphincter tends to separate the iris from the cornea, and will generally succeed in detaching the iris up to the angle. But

where the synechia involves the sphincter, this latter is rendered inactive by being imbedded in the cicatrix, and it is therefore merely the elasticity of the iris tissue, which tends to stretch the iris into a straight line between its origin and the point fixed in the cicatrix. This force is not sufficient to detach the iris from the ligamentum, especially as the direction of the traction is unfavourable, the iris being dragged forward by the synechia. Hence, the iris remains permanently united to the posterior surface of the ligamentum, and in some cases also to the cornea itself up to the synechia. It is evident that this will be the more likely to occur the nearer to the periphery the synechia has been formed.

In those parts of the circumference where the sphincter is not bound down by the cicatrix, the muscle succeeds in pulling the iris from the cornea and in freeing the angle, provided that a firm attachment between iris and cornea has not yet formed, in which event (about one-third of the eyes examined) the obliteration remains permanent, extending from the periphery to the margin of Descemet's membrane.

It is remarkable that in so many cases of anterior synechia the angle of the anterior chamber should be obliterated, not only at the point corresponding to the site of the synechia, but also all round throughout the whole circumference, and yet in spite of the extensive or even total occlusion of the angle no rise of tension has followed. In one of my cases the anterior synechia had been formed 38 years before the eye had to be excised for epithelioma, and although there was peripheral adhesion all round, the tension had always remained normal and the optic nerve showed no cupping. How are we to explain the normal tension in such cases as this, where the outlet of the intra-ocular liquids is apparently blocked by the iris?

As far as I can see, there are two explanations. In the first place, we may surmise that the peripheral adhesion does not effectually exist all round, but that a sufficient area of the circumference of the angle of the anterior chamber has escaped occlusion, extensive enough to maintain the normal outflow. In order to verify this hypothesis, serial sections are required either to demonstrate or to exclude the existence of any normal area in the whole circumference of the chamber. I regret to say that I do not possess a complete series of any of my cases, and therefore this question can be settled only by further investigations.

The second way to account for the normal tension in cases of complete peripheral synechia is to admit that the synechia does not in a noteworthy degree impede the elimination of the aqueous humour. I will recapitulate that, contrary to the condition in glaucoma, the iris in these cases has preserved its normal structure, even in the area of application to the cornea, and that, therefore, it does not form a serious obstacle to the

passage of the aqueous humour into the ligamentum pectinatum. The iris tissue is in open communication with the aqueous chamber by its crypts and is soaked with aqueous humour, which is there under the same pressure as in the chamber itself. The aqueous humour in the iris is thus separated from the ligamentum only by the anterior layer of the iris, which is attached to the ligamentum, and this being loose in its texture does not prevent filtration. Moreover, in many places corresponding to the peripheral crypts, the anterior layer of the iris is absent, and the aqueous humour contained within the iris is therefore in immediate contact with the ligament. I presume that the same hypothesis holds good for cases in which, after iridocyclitis without perforation, obliteration of the angle ensued without producing hypertonia.

If we compare cases of anterior synechia with hypertonia with those above-mentioned, in which the tension has been normal throughout, we find the chief difference to be in the condition of the adherent periphery of the iris. This looks normal or even a little distended in cases with normal tension, whilst it is compressed and atrophied in cases with excess of pressure. I consider this atrophic change to be the effect—not the cause—of the hypertonia.

ANATOMICAL FACTORS IN THE PATHOGENESIS OF GLAUCOMA.*

BY

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IT is impossible within the limits of a single paper to compress the work of some years, far less to attempt to give an explanation for the cause and origin of glaucoma founded on this research; and, therefore, in endeavouring to do so, I would crave the indulgence of my readers.

In a paper[1] which I read before this Section last year at Exeter, I brought forward the view that the various clinical and pathological manifestations of primary glaucoma are the components of two factors—the constant factor and predisposing cause being the physiological sclerosis of the cribriform or pectinate ligament, while the variable factor and exciting cause is vascular and vasomotor, and that it is this last factor which determines the various clinical types, which differ *inter se* in degree but not in kind.

In support of this view, I would now bring forward further anatomical *data* derived from a study, in serial sections, of both normal and pathological specimens.

*A part of this paper was embodied in a demonstration given before the Ophthalmological Section of the British Medical Association at Sheffield in July, 1908.

To obtain from microscopic sections a proper idea of the arrangement and relative position of the structures bounding and forming the angle of the anterior chamber, it is absolutely necessary always to keep in mind that these structures are disposed and arranged at the circumference of a circle. A proper perspective, therefore, of the relationship of these structures can only be obtained by sections which run truly radially. The difficulty in making such sections is altogether minimised by mounting the sections in series, as then not only are the imperfections in one section corrected by the next, but the whole series put together reconstruct fibre for fibre the part sectioned as it actually existed in the living eye. It is in this way that I have carried out my researches and obtained results,

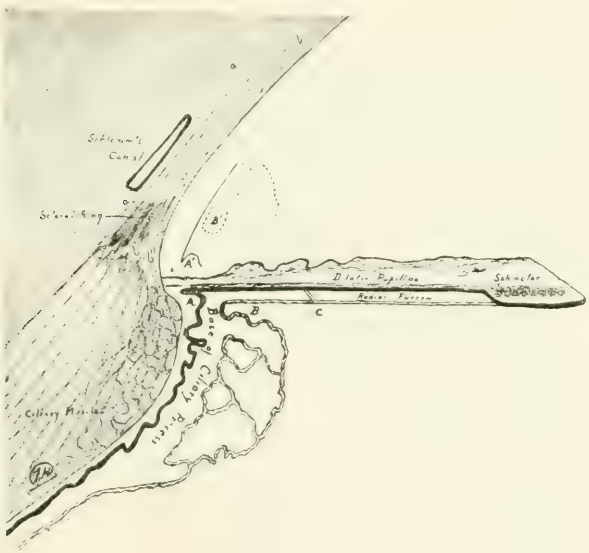

FIG. 1.

Diagram of iris and ciliary body reconstructed from serial sections of normal eye, and illustrating in thick black line an interciliary groove, and its continuation forward into an iris radial furrow.

The pigment layers in the interciliary groove are almost in direct contact with the ciliary muscle, and at A. the groove is continued into the posterior aspect of the iris as a radial furrow, which latter terminates at the periphery of the sphincter pupillæ.

The ciliary process arises at B. from a base which is a continuation of the iris stroma. A section which starts peripherally along a radial furrow at A. and then jumps out of it as at C. will give the appearance as if the iris root had been compressed by the ciliary processes. This appearance is purely artificial, and depends entirely on how the section is cut.

In consequence of congestion and œdema as the iris becomes swollen, its anterior surface at its attachment (×) becomes rolled outwards and applied to the inner aspect of the cribriform ligament, and finally to the posterior surface of the cornea.

The ciliary processes, in consequence of the connection between their bases and the iris root, become rotated forward so that the points A. and B. come to lie at A^1 and B^1, and once the iris has become adherent will remain permanently in this position, in Fig. 3.

which, although contrary to current views, are such that, one can say, represent in every case the study of parts reconstructed section by section. This method of studying serial sections as applied to the ligamentum pectinatum iridis shows that it is a true cribriform structure composed of interlacing circular and longitudinal fibres which are a direct continuation of the inner lamellæ of the cornea.[2] At birth this structure is a cellular formation, but it early manifests fibrous changes, which continue throughout life.

This physiological sclerosis begins in the inner portion of the cribriform ligament (Fig. 1, b to b′ and b″) and is brought about by the constant traction on it of the ciliary muscle as a whole. In other words, the strain of accommodation, so marked in hypermetropia, falls directly on the perforated ligament of the ciliary

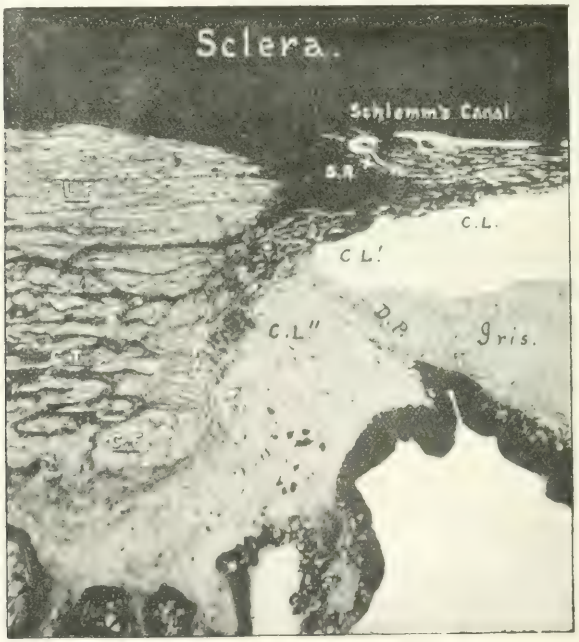

FIG. 2.

Micro-photograph of normal angle of anterior chamber.—A man, aged 60 years. Fixed in formalin. van Gieson's connective tissue stain. There is marked and complete sclerosis of the fibres composing the cribriform ligament (C.L.). At C.L.′ the fibres lie on the inner side of the scleral ring (S.R.) and terminate (C.L.″) by being incorporated into the connective tissue stroma (C.T.S.) here markedly sclerosed of the circular fibres (C.F.) of the ciliary muscle. L.F. longitudinal fibres of the ciliary muscle.

D.P. fibres of origin of a fasciculus of the musculus dilator pupillæ. × posterior extremity of Schlemm's canal into which opens a direct tributary from the ciliary venous plexus which has made its way along the fibres of the cribriform ligament internal to the scleral ring. *Vide* Fig. 7 (2).

muscle. The outer portion of the cribriform ligament, being lost posteriorly in the sclera (Fig. 1, a to a′), is not affected by the action of the ciliary muscle, and here fibrosis is determined by the same agencies, which associated with advancing years induce sclerosis elsewhere in the body. The best demonstration of the course of the fibres of the cribriform ligament is obtained by the use of Weigert's elastic stain, especially if associated with van Gieson's connective tissue stain. Singly and collectively, these methods yield most conclusive evidence that the innermost fibres of the cribriform ligament do not terminate by turning into the iris root, but end by becoming incorporated with the stroma of the circular portion of the ciliary muscle. (Fig. 2 CL″). It is to dissociate altogether any idea of this termination in the iris root, that I have suggested and use the term cribriform, instead of that of pectinate ligament. The cribriform ligament is a true ligament to the ciliary muscle as a whole, and therefore it is pulled taut, not only by the longitudinal, but also by the circular fibres of the ciliary muscle, the sphincter-like action of which latter portion is thus kept in check. It is necessary to note that, as fixation in Müller's fluid is such a slow process, detachment of the ciliary body generally results, producing an altogether false perspective of the relationship of the structures forming the angle of the anterior chamber. This is obviated by the use of formalin. (*Vide* description attached to Fig. 9, and compare Fig. 2 with Fig. 9.)

The only barrier interposed between the aqueous, on the one side, and the supra-choroidal space, on the other, is the insertion of the longitudinal fibres of the ciliary muscle, along and between which the aqueous readily finds its way (Fig. 2 CL′). The most striking proof of this free communication is to be obtained in serial sections of cases, such as chronic iridocyclitis, in which pigment has made its way into the anterior chamber and can be traced passing by this route. Nature's injection experiments are very much finer and more accurate than our crude imitations, which tend to defeat their own ends by causing clogging of the excretory apparatus. In tracing out this course, individual sections do not in themselves carry much weight; but when taken in series, the whole produce a most striking picture, as then each pigment-mass is seen to be, not an isolated unit, but a link in the chain which connects these two lymph spaces. Further corroboration of this connection is to be found in the course of the ciliary veins to be discussed later.

The objection has been raised that if sclerosis of the cribriform ligament were the primary factor in glaucoma, the anterior chamber would be deepened, as in "serous" cyclitis, and not shallowed, as is the rule in primary glaucoma. This deepening in cyclitis is explained by the difficulty the aqueous has in getting away, and, therefore, by collecting in the anterior chamber it

pushes the iris and lens back. This apparently simple explanation accounting for the deepening of the anterior chamber might suffice if it did not violate the very first principles of hydrostatics :—that fluids in a closed sphere are incompressible and transmit pressure equally in all directions. This being the case, it is difficult to perceive how there can be, with a free and open pupil, any possible pressure discontinuity between the anterior and posterior aqueous chambers. The hydrostatic pressure behind the pupil must be the same as that in front of it, and this must hold still more so when we remember that the aqueous is secreted behind the pupil, and has to make its way through the pupil before it can "accumulate" in the anterior chamber. It is, therefore, impossible to imagine how any retention and accumulation of aqueous can occur in the anterior chamber, far less any deepening of it by such a process. It might be suggested, however, that the pressure of the aqueous, as a whole, in both anterior and posterior chambers, was raised so as to push back the lens, and that the iris only passively followed the retreating lens. This view would imply not only that the pressure of the aqueous exceeded that of the vitreous, but that this pressure discontinuity was brought about and borne by the suspensory ligament of the lens, which is likewise impossible to imagine. The same fundamental laws of hydrostatics are bound to apply to a viscid fluid, like the vitreous, as they do to the aqueous, and therefore between these two contiguous fluids there cannot exist any pressure discontinuity either under physiological or pathological conditions of intraocular pressure. A consideration of hydrostatics makes it certain that it is the contiguity of the aqueous and vitreous that prohibits any pressure discontinuity existing between these two fluids, because of the absence of any anatomical structure which could maintain or bring such about. Even the advancement of the lens in glaucoma, as suggested by Priestley Smith's theory, could only take place to a degree and extent which would equalise the pressure between the two fluids.

The cause for the deepening of the anterior chamber in certain conditions of increased intra-ocular tension must, in fact, be sought elsewhere than in a theory, which anatomical conditions do not warrant, and, what is equally important, one which is incompatible with the fundamental principles of hydrostatics.

Priestley Smith's[3] well-known theory assumes that glaucoma arises as the result of a pressure discontinuity between the aqueous and vitreous, brought about by occlusion of the circumlental space by a disproportionately large lens, resulting in compression of the filtration angle by pressure of the ciliary processes against the base of the iris. This theory, widely accepted, does not explain how the clinical results of treatment are obtained or how operative measures act

in restoring and maintaining the balance of pressure between the aqueous and vitreous, supposed primarily to have been disturbed. An iridectomy cannot and does not affect the circumlental space in the slightest, while myotics do, but in the very opposite way necessary to Priestley Smith's theory. Myotics cause spasm of accommodation and therefore the result of the sphincter-like and tonic contraction of the circular bundles of the ciliary muscle must be to reduce the circumlental space still further, and therefore ought to make matters worse, quite apart from what is supposed to happen at the angle when the drug is instilled. In other words, if the *fons et origo mali* in glaucoma is a diminished circumlental space, then an iridectomy and particularly myotics will still allow and permit of occlusion of that space, and this occlusion will lead to discontinuity of pressure between the aqueous and vitreous chambers, *i.e*, to glaucoma, for treatment is applied in front of the area of the circumlental space, occlusion of which, it is suggested, brings about a pressure discontinuity.

A consideration of the principles of hydrostatics makes the fundamental conceptions, on which this theory is based, difficult to accept, as the lens cannot move forwards except to equalise the pressure between the vitreous and aqueous. The hydrostatic pressure in the two chambers of the eye must be identical, even if occlusion of the circumlental space does occur.

Further, if the obstruction in glaucoma lies in the circumlental space, and is caused by turgid ciliary processes jammed up against the lens, and so producing a pressure discontinuity, the result of any incision into the anterior chamber is to reduce the pressure in it still further, and this ought to result in making matters always and invariably worse, instead of better, by forcing the lens still further forward, and so causing still more occlusion of the angle.

This objection ought to apply to every operative measure except posterior sclerotomy, a procedure which Swanzy tells us that he is happy to say he has not had the necessity to resort to.[4]

Viewed from the pathological aspect, this theory—and I take it that a pressure discontinuity between the aqueous and vitreous is its very essence—is incapable of explaining simple chronic glaucoma with an open angle, or those other cases in which an extensive and even total adhesion of the iris occurs on one side and an open angle on the other. If this pressure discontinuity is not the most important part of Priestley Smith's theory, but the occlusion of the angle as brought about by turgid and swollen ciliary processes pushing the iris root forward into the angle, it is equally difficult to understand why in cases of recent traumatic cyclitis, of not more than a few days standing, where owing to infection, etc., the ciliary processes are enormously swollen, occupying the whole circumlental space and pressing

up against the lens, one yet finds, in spite of such turgid processes, the angle anatomically open and not occluded, as ought to be the case if the view is correct that it is the swelling of the ciliary processes in glaucoma that push the iris base into the angle.

The most intense swelling and typical jamming of the ciliary processes against the lens that I have ever met are in such cases of recent traumatic cyclitis with an anatomically open angle.

Again, in cases of long standing, Priestley Smith says that the ciliary processes are usually atrophied *and retracted* (*loco citato*, p. 647.) Now if the iris root is pushed forward by the congested ciliary processes, then once the congestion is relieved and still more when atrophy is taking place, the ciliary processes ought certainly to spring back to their original position. Serial sections show, however, that, in every case in which the iris is adherent, the ciliary processes, whether atrophied or not, are invariably found in a forward position and not retracted (Fig. 3). In cases in

FIG. 3.

Micro-photograph of section from a case of Mr. Richardson Cross of chronic glaucoma. van Gieson's stain. Fixed in formalin. Schlemm's canal (S.C.) with efferent vessel. To the inner side of the sinus lies the sclerosed cribriform ligament. Adherent and atrophic iris (I).

The atrophied and sclerosed ciliary process (C.P.) lies markedly displaced forward and *not retracted*. The process appears in this section detached from the rest of the ciliary body due to unavoidable obliquity in sectioning. The adjoining sections show the attachment to the ciliary body, but then the most anterior point of this process is missed.

which the angle is occluded on one side but open on the other, serial sections show that the ciliary processes on the side where the angle is open are atrophied in their ordinary position, while on the other side they are likewise atrophied, but displaced forwards. The appearance in a random section of a retracted

and atrophied ciliary process with an adherent iris, is due to the section only showing part of the process and not going completely through it, hence it is absolutely necessary that serial sections be studied as only in this way can the part be reconstructed as it actually existed in the living eye. It must not be forgotten, too, in viewing random sections, that when the ciliary processes are atrophied, the inter-ciliary spaces are proportionately larger, and therefore the number of sections going through a single

FIG. 9.

Micro-photograph showing apparent compression of the iris root by the ciliary processes (C.P.) in a normal eye removed by Mr. Kingdom for orbital sarcoma, and in which I injected Indian ink into the anterior chamber within half-an-hour after enucleation.

This appearance is produced, as seen by studying the neighbouring sections, by this particular section striking a radial furrow of the iris pigment layers and then coming out of it.

Serial sections further show that the injected ink has made its way into the iris stroma only where crypts (C.) are present, and so into the perivascular lymph sheaths of the iris veins.

It is to illustrate this further fact that this section is reproduced for the injection of ink has not, as adjoining sections show, been the cause of the "compression," nor has the detachment of the ciliary body, the result of fixation in Müller's fluid, brought it about, as this appearance is equally evident in other normal eyes fixed in formalin, which does not tend to cause detachment of the ciliary body.

This globe having been fixed in Müller's fluid, the ciliary body is detached (D.) and rotated forward round an axis represented by the scleral ring. This rotation forwards is in part responsible for the description universally given that the fibres of the so-called pectinate ligament terminate in the iris root, instead of, as they actually do, in the stroma surrounding the circular fibres of the ciliary muscle (C.F.) displaced forwards in these cases. The ligament is in consequence relaxed, and the angle of the anterior chamber appears therefore as a rounded circular sinus, formed and bounded by the ligament (C.L.) which is here impregnated with ink.

Compare the relationship of the parts here with that in a specimen fixed in formalin as in Fig. 2, in which a line between the posterior end of Schlemm's canal (S.C.) and the circular fibres of the ciliary muscle (C.F.) falls altogether outside the angle of the anterior chamber, while here, owing to fixation in Müller's fluid and consequent detachment and rotation forward of the ciliary body, such a line crosses the angle. The dotted line represents position of transverse section (Fig. 10.)

ciliary process are far less numerous than normal, while, *per contra*, the number going through the inter-ciliary spaces are much more numerous, in consequence of the atrophy of the processes.

I repeat again that I find that serial sections invariably and without exception show that when the iris root is adherent, the ciliary processes always maintain a forward position, and that either when atrophied or in a state of congestion.

In this connection there is a small but very important anatomical detail brought out only by serial sections which throws considerable light as to how this forward position is brought about and maintained. Serial sections of a normal eye show that the appearance of the posterior connection of the iris with the ciliary body varies depending on whether the section runs through a ciliary process or through an interspace between the processes (Fig. 1). This difference is due to the interciliary grooves being at a lower level than the base from which the processes arise. The bases of the ciliary processes are, in fact, a direct continuation backwards of the iris stroma, while the inter-ciliary grooves, running at a lower level, are continued into

FIG. 10.

Micro-photograph of transverse section at the level of the apices of the ciliary processes from the same case as Fig. 9, showing furrows of the iris pigment layers (F. & F.[1]). The two lateral folds (F.[1]) are not sectioned quite truly transversely as must naturally happen considering that these folds run radially. Iris crypt (C.) filled with ink. Apices of ciliary processes (C.P.) In the interciliary spaces lie transversely cut zonular fibres (Z.) which also form a line in front of the hyaloid membrane (H.) of the vitreous (V.)

The dotted line represents the direction of a meridional section that would give rise to appearance of apparent compression of the iris root, if the section proceeding centrally were to suddenly leave the furrow as has happened in Fig. 9.

In the further sections of this series the radial furrows (F. & F.[1]) can be traced as direct continuations of the interciliary grooves (*vide* Fig. 1).

The depth of the transversely cut radial furrow (F.) corresponds to the amount of the "compression" in Fig. 10, as is always the case.

the posterior iris surface as radial furrows. A section of the iris, which starts peripherally along a radial groove and then jumps out of it (Fig. 1, A to C) will give an appearance as if the root of the iris had been compressed by the ciliary body. This appearance of compression is altogether artificial and depends on how the sections run in relation to these radial grooves, as it can be made out equally well in perfectly normal and not merely in glaucomatous eyes, as described by Priestley Smith. The cause is at once apparent when a study of serial sections is undertaken. (Figs. 9 and 10.)

A consideration of the relationship of the iris root to the ciliary body under normal and pathological conditions leads me to the conclusion that in glaucoma it is not the iris which is pushed forward by the ciliary processes, but, on the other hand, it is the ciliary processes which are dragged forward by the iris, congestive œdema of which causes its root to become first applied and then adherent to the cornea. Once the ciliary processes are dragged or rather rotated forwards by the œdematous iris, they are retained in their new position on the subsidence of the congestive attack, and if the iris has become adherent, not only on account of the continuity of the pigment layers, but what is much more important because of the continuity of the underlying homogenous membranes, which, besides being two to three times thicker in adult life than in childhood, are intimately associated with the connective tissue stroma of the iris and ciliary body. In adult and senile life the connective tissue stroma of the ciliary processes shows, especially in glaucoma, marked sclerosis, and this, coupled with the close connection between the now thickened hyaline layer of the ciliary body and its connective tissue stroma, favours the rotation forward *en masse* of the ciliary processes.*

To appreciate how this mechanism of occlusion of the angle is brought about, it will be necessary to discuss next how congestion and œdema of the uveal tract arises.

It has long been recognised that Schlemm's canal is the

*The anatomical continuity of the posterior limiting layer of the iris with the hyaline layer of the ciliary body, and the progressive thickening that both these layers undergo with advancing years are both factors which strongly militate against the view now gaining ground that the musculus dilator pupillæ is an ectodermic muscle formed by the anterior of the two pigmented layers of the pars iridis retinæ, while the fibres of the muscle compose the posterior limiting membrane of the iris. Serial sections show that the dilator pupillæ is not a continuous muscular sheet, as has somehow always been expected, as such a muscular structure would be far too powerful for its antagonistic sphincter, but it consists of isolated radial fasciculi of non-striped muscle lying anterior to the posterior limiting membrane, and immediately in front of the radial furrows which groove the posterior aspect of the iris.

The fasciculi of the dilator pupillæ arise from the inner aspect of the innermost fibres of the cribriform ligament just before the fibres of the ligament become lost, and incorporated in the connective tissue stroma of the ciliary muscle (Fig. 1 D. P.). The bundles of the non-striped muscular fibres course radially inwards just in front of the radial grooves of the iris pigment layers, and terminate by a direct insertion into the connective tissue stroma of the sphincter pupillæ (Fig 3).

chief channel of the aqueous outlet. It is therefore strange, considering the controversy that raged concerning the nature of Schlemm's canal, that it did not strike some observer to study serial sections and in this way to make out the venous connections of that sinus. Though now, thanks to the work of Leber, the venous nature of Schlemm's canal is admitted, yet from a practical point of view this fact is certainly not appreciated. In Parsons' *Pathology of the Eye*,[5] although Schlemm's canal is described as a venous sinus (p. 959), yet one finds the extraordinary statement that the operation of "sclerotomy aims at opening the filtration angle *and canal of Schlemm*"[5] (p. 1111). With such an object in view, the result of such procedure, if the aim should hit the mark, is phlebotomy, pure and simple.

Serial sections show that Schlemm's canal has a far more extensive venous connection than originally made out by Leber, in that the vessels, which perforate the sclera at the pericorneal circumference, after anastomosing freely with each other, are all directly or indirectly connected with that venous sinus.[6] In spite of the most careful research, I have failed to find a single anterior perforating scleral vessel which, traced in serial sections, was not thus connected. One of the most important points brought out by such a study is the direct or indirect connection of the so-called anterior ciliary arteries with Schlemm's canal, thus proving that this vessel is a vein and that likewise its continuation, the circulus arteriosus iridis major, is not an arterial circle but likewise a sinus venosus iridis (Figs. 4, 5, and 6).

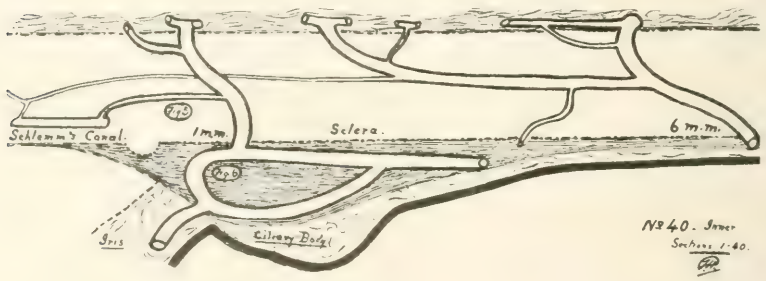

FIG. 4.

Composite diagram from serial sections, illustrating connection between iris veins, circulus venosus iridis, *i.e.*, so-called circulus arteriosus in anterior ciliary veins and Schlemm's canal.

The posterior of the two perforating scleral vessels might be truly called an anterior choroidal vein. This vessel is connected with an efferent vessel from Schlemm's canal. Figs. 5 and 6 refer to micro-photographs.

Serial sections also show that the anterior ciliary veins are much more numerous than described, as there are present never less than one, frequently two, and occasionally three to each mm. of the corneal circumference. The origin of these vessels,

besides, is not from only the outer side of the ciliary muscle, but from the capillary venous plexus existing in the interstitial tissue of the whole of the ciliary muscle and with the veins from the ciliary processes themselves.

Space will not permit me to detail the close direct and indirect connections existing between the veins of the ciliary

FIG. 5.

Micro-photograph of section belonging to the series from which the diagram (Fig. 4) was reconstructed.

Schlemm's canal (S.C.) receives at its posterior margin an afferent vein (A.V.) from the perforating scleral vessel (V.), which is a continuation of V.[1] and of so-called circulus arteriosus (C.A.).

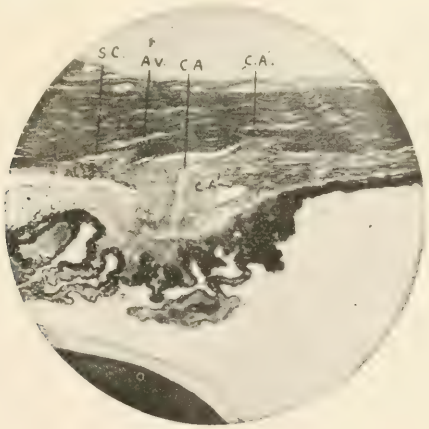

FIG. 6.

Micro-photograph of an adjacent section to that illustrated in Fig. 5, which completes the connection existing between the so-called arterial circle and anterior ciliary artery (C.A.) and the perforating scleral vessel (V. and V.[1]) of Fig. 5.

Schlemm's canal (S.C.) with now only a small portion of afferent vein (A.V.)

processes and Schlemm's canal, but a glance at the reconstructed diagram (Fig. 7) shows how this is brought about and how the

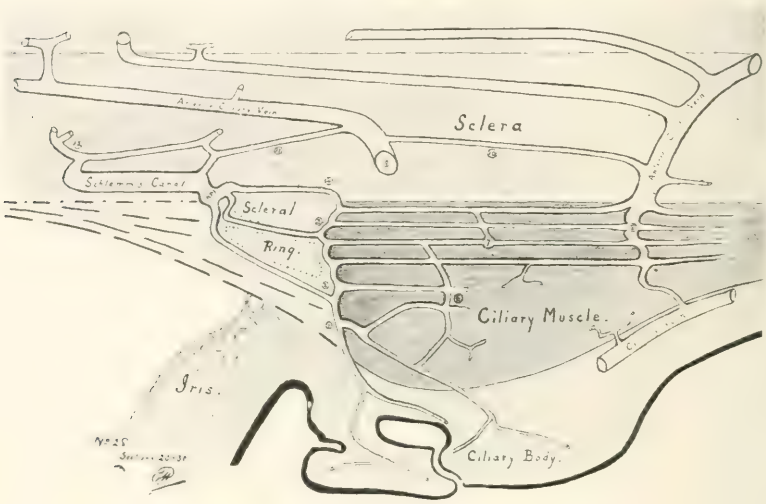

FIG. 7.

Reconstructed diagram from serial sections showing course of ciliary veins and their connection with Schlemm's canal.

(1) Veins from ciliary process meeting to form a branch which runs directly outwards between, and anterior to the fasciculi of the ciliary muscle. These vessels give off anteriorly tributaries to Schlemm's canal and posteriorly branches which run in the interstitial tissue of the ciliary muscle. The direct afferent vessels to Schlemm's canal run internal to (2), through (3), and external to (4) the scleral ring and they join Schlemm's canal at its posterior margin (5). *Vide* Fig. 2 (x). In the interstitial tissue of the ciliary muscle lies a network of veins (6) and (7) which run together to form a perforating anterior ciliary vein.

The anterior of the two perforating scleral veins seen here in cross section (9) arises in exactly the same way by deep branches from the ciliary process as the posterior one with which it is connected (10), Afferent (11) and efferent (12) vessels of Schlemm's canal.

venous capillaries permeate the whole of the connective tissue stroma of the ciliary muscle. It is along the perivascular sheaths of the vessels that pigment granules can be traced making their way from the angle of the anterior chamber into the suprachoroidal space, through the posterior portion of the cribriform ligament.

These deeper connections of the anterior ciliary veins are best made out in senile eyes, in which, owing to the sclerosis of the interstitial tissue between the fasciculi of the ciliary muscle, the vessels stand out in a more marked manner.

The tributary veins of Schlemm's canal are thus derived not merely from the outer portion of the ciliary muscle, but from the whole of the ciliary body and its processes, as well as from the iris—in short, from the whole anterior portion of the uveal

tract. This close association between Schlemm's canal and the anterior half of the uvea has the utmost bearing on the aetiology, pathology, and treatment of increased intra-ocular tension.

The importance of Schlemm's canal, as the chief physiological outlet of the aqueous, is due to the fact that it is a venous sinus formed by tributary vessels derived from both the iris and ciliary veins. It therefore follows that, having been already through one set of capillaries, the blood-pressure in the afferent veins of Schlemm's canal and therefore of Schlemm's canal itself must be less—just slightly less—than that in the original capillary venous areas of the iris and ciliary body. It is because the blood-pressure within it is the lowest venous pressure with which the aqueous comes into direct contact that Schlemm's canal owes the preponderant *rôle* it plays in aqueous absorption under physiological conditions.

The iris surface is not an absorbing area in the ordinary sense of the word, but it has this power, because, and only because of, those clefts on its surface, universally known as "Fuch's iris crypts" after their distinguished discoverer, to whom ophthalmology owes so much, and to whom I personally am so deeply indebted. These crypts, by bringing the aqueous into direct contact with the iris veins, permit of absorption, when circumstances require an extra outflow.

But for the advantage that Schlemm's canal has of having, for reasons already stated, a slightly lower blood-pressure than that of the iris veins, there would be no anatomical reason whatsoever why the iris under physiological conditions should not play an equally great part in absorption as the venous sinus of Schlemm's canal, because in consequence of its crypts the aqueous is brought into direct contact with the walls of the iris veins, in exactly a similar manner as the cribriform ligament allows the aqueous to come into contact with the venous sinus of Schlemm's canal embedded in the sclera.

Leonard Hill[7] by his magnificent researches into the cerebral circulation has experimentally proved that, in the closed and rigid case of the cranium, the intra-cranial pressure is equal to the capillary venous pressure and varies directly with it. An increase in the one always produces a corresponding and equal increase in the other, and thus it follows that, under pathological conditions of increased intra-cranial pressure, as the tension rises the whole of the elastic vascular system is converted into one of rigid tubes. Leonard Hill's conclusions are applicable in every way to the globe of the eye in which the capillary venous pressure must, for the same reasons, be equal to the intra-ocular pressure. Under physiological conditions one can go further and say that *the intra-ocular pressure equals that in the venous sinus of Schlemm's canal.* This is a deduction which naturally follows in consequence of the venous pressure within the sinus being just less then that within the iris veins, and therefore the

lowest venous pressure with which the aqueous comes into direct contact and so its easiest exit. When the intra-ocular tension rises above that within Schlemm's canal, then the hydrostatic pressure of the aqueous, by causing pressure on the sinus wall, and reducing its lumen, raises the venous blood-pressure within the sinus. As soon as the blood-pressure within the sinus equals that within the iris veins, the latter are put on an equality with the former, and the aqueous will drain away equally well through the iris crypts and veins as through the cribriform ligament and Schlemm's canal The resulting increased outflow through the iris veins reduces the hydrostatic pressure of the aqueous, and the pressure on the sinus being removed, the venous blood-pressure within Schlemm's canal falls again to its normal. That is to say, the absorption of the aqueous into the venous sinus of Schlemm's canal must take place at the same hydrostatic level. The normal venous pressure within Schlemm's canal cannot be above that of the aqueous (which is the same as the general intraocular tension) because if so aqueous outflow could not take place into a higher hydrostatic level and the intraocular tension would rise till it were the same, while if, on the other hand, the venous pressure within the sinus were less than the hydrostatic pressure of the aqueous, this latter would prevent any circulation through the sinus at a less pressure than that acting on the walls of Schlemm's canal. It is for these reasons that the normal intra-ocular tension must equal that in Schlemm's canal and that every physiological variation towards increase in the intra-ocular tension must be compensated for by increased outflow through the iris veins, which outflow prevents the tension of the eye from mounting and remaining at any permanent higher level. The iris veins and crypts constitute a regulating mechanism, and it is in consequence of this function that under conditions of increased intra-ocular pressure, whether pathologically or experimentally produced, the size of the pupil plays such an important part—a part which is quite inexplicable until the anatomical connection existing between the venous sinus of Schlemm's canal and the iris veins is appreciated.

Parsons (*loc. cit.*, p. 1047) states that while this condition of equality and balance between the capillary venous pressure and intra-ocular pressure holds good under normal conditions, it "will not hold for variations of intra-ocular pressure as it does in the case of the brain, because under these circumstances the eyeball is no longer a rigid case."

The property of rigidity does not, however, exist as an absolute condition, but only as a relative one, in comparison with something less or more rigid.

A closed capsule of connective tissue, like that forming the globe of the eye, is not as firm as the shell of bone forming the skull, but its cubic capacity, like that of the cranium, is strictly

limited ; and it is just because its cubic capacity is limited that the eyeball under conditions of increased intra-ocular pressure is a rigid case. Koster experimentally proved the unyielding nature and rigidity of the globe under conditions of increased intra-ocular tension by showing that if the internal pressure were raised from 19 mm. Hg. to 70 mm. Hg. :—which is equal to a rise of pressure from normal to that in acute glaucoma—the increase in the volume of the globe is only $\frac{1}{1000}$ of the original volume, and therefore "quite inappreciable" in amount, as Parsons himself says (*loco citato*, p. 1042). This admission of Parsons, when referring to the results of Koster's experiments, is therefore in absolute contradiction to the statement—which I have already quoted—which he makes as to the applicability of Leonard Hill's work to the globe of the eye. Rigidity in the case of a closed receptacle containing fluids implies that its cubic capacity is strictly limited, and this applies equally well to the coverings of the eye as to those of the brain.

The further fact brought out by Koster that the insignificant amount of stretching of the globe of the eye is not even proportional to the pressure, but becomes continually less with increasing pressures, goes still further to prove that Leonard Hill's work on variations of the intra-cranial pressure can be applied *in toto* to the eye with its unyielding tunics.*

As the internal capacity of the eye cannot be increased, it is not the total volume of the contents of the globe which is altered in glaucoma, but *the tension* of the volume which is raised.

This rise in tension is purely vascular in origin and nature, and is brought about by a rise in pressure of the intra-ocular contents from that of their normal and physiological capillary venous pressure towards that of the arterial side, and that not in one part but throughout the whole intra-ocular contents, as there is no pressure discontinuity between the vitreous and aqueous. In other words, the intraocular tension, whether physiological or pathological, is, as in the case of the brain, purely circulatory in origin. This aspect of the intraocular tension is in no way

*As "the intra-cranial pressure is in all physiological conditions the same as the cerebral venous pressure" and "the cerebral venous pressure varies directly and absolutely with general venous pressure, but only proportionately with general arterial pressure," (Leonard Hill, *loc. cit.*) it must naturally follow, if the above deduction is correct, that the intra-ocular and intra-cranial pressures stand at the same level :—in other words, that under physiological conditions they rise and fall together, for it would be inconceivable that the pressure of the vitreous, on one side of the *lamina cribrosa*, differed from that in the vaginal sheath of the optic nerve. Dr. Leonard Hill most kindly undertook to put this to experimental proof. Since writing the above he has informed me that in a cat, a gauge connected with a hollow needle in one eye, and another pressure gauge in the brain, both gave the same reading, and both went up together when the abdomen was pressed—conclusive evidence of the total application to the eye of *data* derived from a study of the intra-cranial pressure. The importance of the identity of the hydrostatic pressure within the globe of the eye with the intra-cranial pressure, is also of the utmost value in explaining the causation of the cupped disc in those cases of non congestive glaucoma in which no appreciable tension has ever been noted.

disturbed by the question of the nature of the formation of aqueous, any more than it is in the analogous case of the intracranial pressure by considerations of the nature of the formation of the cerebro-spinal fluid.

The capacity of the globe being fixed, it follows that a rise of vascular pressure—whether arterial or venous—is transmitted directly to the intraocular contents—the vitreous and aqueous. Under physiological conditions, as already explained, this rise is at once compensated for by an increased outflow, as the capillary venous areas are so extensive and the aqueous outlet so free, both of which conditions permit of a complete measure and extensive range of compensatory outflow coming into play. It is thus, that under physiological conditions, no pathological increase of pressure can be transmitted by the intraocular contents; it is far otherwise, however, under pathological conditions, as in glaucoma, where the main aqueous outlet is shut down and diminished, so that the range of compensatory outflow is proportionately reduced or abolished altogether.

The primary and constant factor in glaucoma, and at the same time its predisposing cause, consists in sclerosis of the cribriform ligament. This sclerosis, by narrowing down the meshes of the filtration network, causes a mechanical obstruction to the free access of the aqueous to Schlemm's canal.

As this obstruction increases, the aqueous depends more and more on the iris crypts and veins for finding a ready outlet, and if this is not sufficient, the tension slowly and imperceptibly rises, producing the clinical type of chronic non-congestive glaucoma.

Under normal and physiological conditions, no continuous and pathological increase of pressure can be transmitted by the intra-ocular fluids, as the aqueous cannot be retained in the anterior chamber at a tension higher than that within Schlemm's canal and iris veins, for, as the pressure in both veins and aqueous must go hand in hand, the effect is only transitory and is at once righted by an increased outflow.

When, however, the range of the potential outlet is diminished by sclerosis of the cribriform ligament, to an irreducible minimum, or below the safety point, then a congestive glaucomatous attack will be precipitated at any time by conditions which will still further reduce the available outflow, or, on the other hand, increase the vascular tension—either on the arterial or venous side (Fig. 8).

In an eye predisposed to glaucoma, *i.e.*, in an eye in which the cribriform ligament is sclerosed and therefore with a diminished range of outflow, a congestive glaucomatous onset will be precipitated by:—

(1) **Dilatation of the pupil,** resulting in closure of the iris crypts and abolition of the last-remaining aqueous outlet.

(2) **Rise of arterial pressure.**—A rise in arterial pressure, by causing more arterial blood to come into the eye, produces,

as has been shown experimentally by many observers, a rise in intra-ocular tension. In glaucoma this rise cannot be compensated, as under physiological conditions, by a correspondingly increased outflow, owing to sclerosis of the cribriform ligament and hence the tension of the intra-ocular contents (vitreous and aqueous) becomes directly raised above their normal capillary venous pressure and so veins are compressed. The resulting congestion now causes still more increase of intra-ocular pressure and so a vicious circle is established. As the veins are compressed, the pressure within them and without

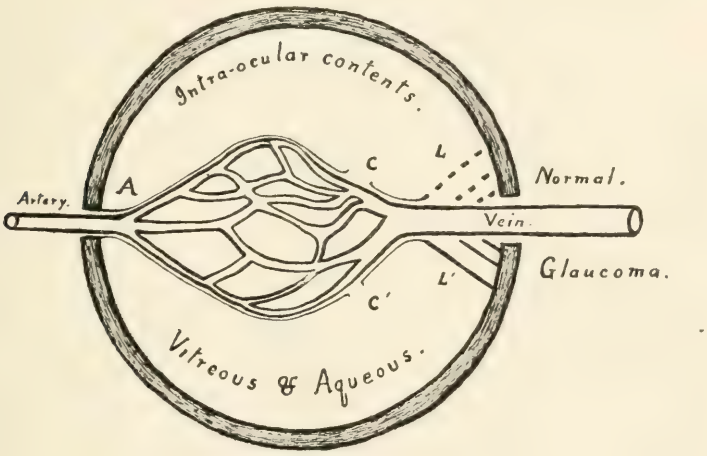

FIG. 8.

Schema illustrating the ætiological factors of glaucoma.—The globe of the corneo-sclera is analogous to a rigid case because its internal cubic capacity is strictly limited. Any increase in volume of the vascular contents must be compensated by an outflow of a corresponding and equal volume of aqueous. The upper half of the diagram represents the normal eye with open meshes of cribriform ligament (L) and iris crypt (C.). The lower half represents an eye with tendency to glaucoma, in which cribriform ligament (L.[1]) is sclerosed and meshes narrowed or occluded altogether, leaving iris crypt (C.[1]) to carry on the greater part or all the work of drainage. This route may just fail to be sufficient, giving rise to simple, non-congestive glaucoma. Acute glaucoma will follow (1) closure of iris crypts (C.[1]). (2) Increased flow of arterial blood at A. which cannot be compensated by increased outflow of aqueous at L.[1] and C.[1] Veins are compressed, congestion follows and a vicious circle is set up. (3) Venous stasis, which means not only more blood in the eye but diminished absorption already reduced to a dangerous minimum.

them rises from the venous towards arterial pressure, so that the whole elastic vascular system, as in the case of the brain under analogous conditions, becomes converted into a rigid system of tubes.

(3) **Rise in venous pressure.**—Venous congestion has long been recognised as one of the most important exciting causes of the glaucomatous onset. Venous stasis implies not only increased volume of venous blood in the eye, but it also means diminution in

absorption and the rise in the same ratio of the general intra-ocular pressure. Bearing in mind the close venous relationship existing between the anterior portion of the uveal tract and Schlemm's canal, and that further in glaucoma the iris veins have an excessive proportion if not all the work of drainage thrown upon them, it is easy to appreciate how congestive conditions of any portion of the uvea by raising the pressure however slightly in the venous return from the iris, and causing a corresponding diminution in absorption, will upset the now finely-set balance of the aqueous outflow. This balance once upset a vicious circle is at once established, as the resulting increased intra-ocular pressure causes further congestion, and so on.

The result of a rise in intra-ocular pressure brought about by any, or combination of any, of the exciting factors just mentioned, in an eye in which the range of aqueous outflow is diminished, is to produce congestion and œdema of the whole uveal tract.

Congestive œdema of the iris results in its base becoming applied to the cornea, producing occlusion of the angle. This condition is, however, quite a secondary manifestation, whose extent and amount depends altogether on the acuteness and degree of the congestive onset, but once started, each succeeding congestive attack causes more and more of the iris to become automatically, so to speak, first applied and then adherent to the back of the cornea.

In consequence of the anatomical connection already described, existing between the iris root and the base of the ciliary processes, the latter become pulled and rotated forward by the adherent iris. In other words, this forward displacement of the ciliary processes, whether congested or atrophied, is not the cause but the effect of adhesion of the iris to the posterior surface of the cornea.

The marked shallowing of the anterior chamber in the acute glaucomatous onset is another manifestation of the congestive œdema of the uveal tract. It follows in consequence of the total relaxation of the suspensory ligament of the lens, produced by congestion and swelling of the ciliary body, and seat of origin of the zonular fibres. The shell of flexible and last-formed fibres of the lens are thereby released from all restraint and allowed full play, so that the lens assumes the maximum spherical shape possible to its age. Such alteration in shape that can occur, associated with, and following in consequence of the more important factor of total relaxation of the zonular fibres allows the lens to fall into a more anterior position. This forward movement is one confined to the lens system itself, and corresponds in degree to the amount of total relaxation of the suspensory fibres; the tension of the media behind the lens being no greater than that in front of it, as long as the globe of the eye remains intact.

Summary.

From what I have stated in this and in other papers, I would summarise as follows the fundamental anatomical and pathological factors directly bearing on the aetiology and treatment of glaucoma :—

1. The globe formed by the corneo-sclera is analogous to a rigid case, because its internal capacity is strictly limited and cannot be increased.

2. The intra-ocular pressure—like the intra-cranial—is purely circulatory in origin and represents the capillary venous pressure within the eye, and for anatomical reasons, more particularly the venous pressure within Schlemm's canal.

3. The iris owes its absorptive power to Fuch's iris crypts, which allow the aqueous direct access to the iris veins.

4. Serial sections show that the venous sinus of Schlemm's canal is formed by tributaries from the whole anterior portion of the uveal tract. The venous pressure in the sinus is thus the lowest with which the aqueous comes into direct contact, and absorption taking place only at the same hydrostatic level, accounts for Schlemm's canal being the main aqueous outlet.

5. Whenever the hydrostatic pressure of the aqueous rises above that within Schlemm's canal it causes pressure on the sinus walls and the blood-pressure will mount. As soon as the blood-pressure within Schlemm's canal equals that within the iris veins, the latter are put on an equality with the former and the aqueous will drain away equally well through the iris crypts and veins as through the cribriform ligament and Schlemm's canal. The resulting increased outflow reduces the hydrostatic pressure of the aqueous on the sinus, so that its blood pressure again falls below that of the iris veins.

6. Under physiological conditions, on account of the complete measure and extensive range of compensatory outflow—*via* the iris crypts and veins—which follows any increase in volume of the vascular contents of the eye, variations in intra-vascular pressure cannot be transmitted to the intra-ocular contents (vitreous and aqueous) so as to cause a permanent rise in tension.

7. Physiological sclerosis of the cribriform ligament diminishes the aqueous outflow through Schlemm's canal and throws a greater proportion of the work of drainage on the iris crypts and veins.

8. If the iris crypts are not equal to the work, tension slowly and imperceptibly rises—non-congestive glaucoma.

9. The intra-ocular fluids (vitreous and aqueous) transmit pressure equally in all directions, and therefore when their exit is diminished and tension rises, vessels are compressed and the pressure within them, and also without them, rises, so that the whole elastic vascular system within the eye tends to be converted into a system of rigid tubes.

10. Hindrance to the ready access of aqueous to Schlemm's canal cannot be the cause of the deepening of the anterior chamber in "serous" cyclitis or "simple" glaucoma, as with a free and open pupil the pressure in the anterior chamber cannot rise above that in the posterior aqueous chamber into which the aqueous is first secreted.

11. In pathological as in physiological states of intra-ocular tension, there is no pressure discontinuity within the globe of the eye.

12. In an eye with tendency to glaucoma, *i.e.*, with sclerosed cribriform ligament and therefore diminished range of outflow, a congestive glaucomatous onset will be precipitated by:—

(a) Dilatation of the pupil, resulting in closure of the iris crypts and abolition of the only remaining aqueous outlet.

(b) Arterial rise of pressure. The aqueous is an escape valve which allows more arterial blood to come into the eye. If the aqueous cannot escape, then on rise of arterial pressure veins are compressed and a vicious circle started.

(c) Rise in venous pressure. Venous congestion implies not only an increased volume of venous blood in the eye, but diminished absorption already reduced to a minimum.

13. The difference between chronic non-congestive and acute congestive glaucoma is one of degree and not of kind.

14. With the rise in intra-ocular tension the whole of the uveal tract participates equally in the resulting congestion and œdema.

15. The amount and extent of the occlusion of the angle of the anterior chamber depends directly on congestive œdema of the iris, causing its base to become applied and then adherent to the posterior surface of the cornea. Once started, this process automatically increases with each congestive attack.

16. The forward displacement of the ciliary processes, whether congested or atrophied, is not the cause but the effect of the adhesion of the iris to the posterior surface of the cornea.

17. The marked shallowing of the anterior chamber is another manifestation of the acute congestive œdema of the uvea, and results from swelling of the orbiculus ciliaris, causing slackening of the zonular fibres and so allowing the lens to come forward.

18. Treatment does not affect the route to Schlemm's canal, already made impassable, but depends altogether on the iris for its success. The greater the disorganisation of the iris the less treatment avails.

19. Myotics are only beneficial in proportion as they open out the existing iris crypts.

20. The success of iridectomy depends on the direct path it makes for the aqueous to come into direct contact with the iris veins. The base and pillars of the coloboma form a large crypt occupying, as it were, three sides of a square, since the cut surfaces of the healthy iris do not cicatrise.[8]

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CLINICAL MEMORANDUM.

PTOSIS TREATED BY CAUTERY.

BY

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THE following method of dealing with slight ptosis is one I have used for several years past. It is intended for cases in which advancement of the tendon of the levator, or an equivalent operation, is usually performed. The eye is well cocainised and the upper lid seized with a pair of cilia forceps, or Mules' ptosis forceps, and everted, so as to expose the upper border of the tarsal "cartilage." This done, a series of punctures are made with a suitable cautery; Snell's answers perfectly, but a Wordsworth's, with a somewhat longer and slightly stouter point, is at times useful. Whichever instrument be used, a series of apertures are burnt in the peripheral part of the tendon immediately adjacent to the "cartilage," as shown in the accompanying illustration. In very slight cases a single row of punctures is enough, but when a greater effect is needed, another row, or, indeed, several rows, may be made. As a rule, it is necessary to push the cautery upward towards the orbital margin in the neighbourhood of the fronto-palpebral fold.

Several times I have performed the operation by cocainising the eye, then injecting a very small quantity of eucaine under the skin of the lid above the tarsal "cartilage," and subsequently making a small aperture in the skin to admit the cautery. As the skin is freely moveable, the skin aperture can be moved from side to side, so as to allow the cauterisation where needed. In performing the operation by way of the skin opening, it is prudent to pass a broad spatula between the lid and the globe,

the instrument being used to *lift* the former so that the spatula cannot possibly injure the anæsthetic cornea. Usually, but not always, the conjunctival method is best.

The advantages of this method of operation are:—(a) It can be performed with the patient sitting in a chair in the out-patient room. (b) There need be no hesitation in operating on slight cases, as the result can be accurately controlled. (c) Patients have no dread of a second or third operation, should such be necessary. (d) The patient is not incapacitated and need only wear a shade—with a little cotton wool under it—to keep the lid still, for few hours. (e) The operation takes only about a minute or a minute and a half.

Doubtless, an electric cautery would do, but as Snell's instrument is exactly of the size needed to make the punctures, and is, on the whole, more manageable than the former, there is very little inducement to give up its use

NOVELTIES.

NOAH'S ARK TEST-TYPES,

BY

H. BEALE COLLINS, D.P.H.

KINGSTON-ON-THAMES, SURREY.

THE Noah's Ark test-types have been arranged to correspond as nearly as possible with the letters of Snellen's types— $\frac{6}{6} - \frac{6}{9} - \frac{6}{12}$, etc.

The limbs and minor characteristics of animals and common objects cannot always be in the same definite size, although relation to the larger parts, as the limbs of letters, are in their scientific arrangement for Snellen's types. The trunk of the elephant, or the antennæ of insects, must, in order to strike the eye by their similitude, be shown of a relatively small size as compared with the bulk of the animal or insect. The body being

compared to the thicker parts of the letter and the legs to the thinner parts, it is evident that the trunk of the elephant, antennæ, etc., or similar distinctive marks of an animal would be on too small a scale to be visible at the distance at which the grosser parts would be clearly seen. These grosser parts would be unrecognizable

without the smaller characteristics, so each figure has been drawn of such a size that it may be recognized, as a whole, by a person with normal vision at the distances for which it is marked for use.

It is not contended that these types can, in any way, supersede the use of Snellen's types, nor that when the figure is distinguished at the distance marked, anything more than an approximate appreciation of the acuity of vision can be ascertained.

It is of great importance in some cases to gauge the vision of young children before they know their letters. Other children decline to recognize letters who would be proud to show their acquaintance with animals and other objects of interest. The types may also be useful for persons of weak intellect, or for natives unacquainted with the Latin letters. They are to be obtained of Messrs. Knapp, Drewett & Co., Kingston-upon-Thames.

TRANSLATION.

ON SIMPLE SCLERECTOMY IN CHRONIC SIMPLE GLAUCOMA.*

BY

DR. FÉLIX LAGRANGE,
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Introduction.

THE question whether in the treatment of glaucoma the operation of sclerecto-iridectomy acts by resection of the sclera or by excision of the iris, appears to me one to be decided by clinical observations.

Aside from all reasons which demonstrate not only the utility but also the necessity of the filtering cicatrix, and aside from the facts, now so numerous, where sclerecto-iridectomy has yielded unhoped-for results, cases may be recalled in which iridectomy having failed, it has sufficed to open the wound and to resect the sclera, to obtain filtration and a reduction in the intra-ocular pressure. I published such an observation in 1906, and in the *Annales d'Oculistique* for June, 1908, Valude has related the history of a *confrère* in whom he was able to compare the value of iridectomy and of sclerecto-iridectomy. Valude operated upon both his patient's eyes—the better one by iridectomy, and the other by sclerecto-iridectomy. As regards the first-named, tension did not fall, while visual acuity continued to diminish. As regards the other eye—the one treated by the operation of sclerecto-iridectomy—tension fell to normal and the sight improved considerably; so much so, indeed, that the patient demanded that sclerectomy should be performed on the eye already subjected to iridectomy. The operation was actually done, and the eye, which had failed despite iridectomy, recovered, and its visual acuity rose considerably after the sclerectomy and the filtration resulting from that operation.

It would seem difficult to bring under the notice of the Society better evidence as to the value of the filtering cicatrix. To-day, however, I am able to present an even more convincing proof, inasmuch as I am in a position to report six cases of simple sclerectomy practised with success in glaucomatous patients.

Our eminent colleague Abadie once remarked to me: "You have not demonstrated the value of sclerectomy unless you practise simple sclerectomy." I replied that I had never dared to undertake that operation, because I feared an entanglement of the iris in the wound and all the dangers of prolapse. I then

*Communication made to the Paris Ophthalmological Society on July 7, 1908, and now translated from *Archives d'Ophtalmologie*, August, 1908.

believed that simple sclerectomy was very dangerous. But I was grossly deceived. As a matter of fact, the operation is easy and innocent in cases of simple chronic glaucoma.

If the eye to be operated on has an obvious tension of ½ or 1 (feeble), it is convenient, before interfering with it surgically, to reduce the hypertension to normal by adrenaline, eserine, and cocaine. The liberal employment of these three agents, besides, facilitates operation by inducing hæmostasis, by freeing the angle of the iris by contracting the pupil, and by rendering the eye anæsthetic.

I advise that each of the solutions in question, in the ordinary strength, be dropped into the eye three times at intervals of ten minutes before the operation. If, contrary to all expectation, the instillation of these collyria does not keep the iris in place—that is, if a prolapse occurs—the attempt at simple resection will not harm the patient: the operation is finished by iridectomy.

Method of Operation.

The operation is precisely the same as that which I have already described as forming the first two stages of my sclerecto-iridectomy. I incise the sclera as far as possible from the cornea, keeping the blade all the time in the anterior chamber. In other words, I pass the knife in front of the iris, keeping the instrument as near to the iris as possible. It is not necessary to cut a large flap: an incision of 4 mm. will suffice.

After having made the puncture and the counter-puncture, the Graefe knife enters (*entame*) the tendon of the ciliary muscle, which it divides, and opens largely the choroidal spaces, which are thereby placed in communication with the anterior chamber. After having divided the ciliary muscle, the knife cuts the sclerotic, and, finally, detaches a large flap of conjunctiva. The conjunctival flap being raised with small forceps, the wound gapes and its anterior lip is drawn forwards, and a strip of sclera is then excised by means of scissors from the lip. Lastly, the conjunctival flap is utilized to cover and to protect the breach in the sclerotic.

The reader will gain a clear idea of the way in which the resection should be carried out if he reads what I have written elsewhere upon the subject of sclerecto-iridectomy (*Archives d'Ophtalmologie*, August, 1906, and *Annales d'Oculistique*, February, 1907*). The filtering cicatrix is the same in simple scleral resection as in the combined operation of iridectomy and sclerectomy. The two accompanying pictures (Figs. 1 and 2) show the condition in a couple of my patients.

It may be remarked that the operation described, the aim of which is to open largely the coats of the eyeball without entangling the iris, is possible only when the anterior chamber is deep and no adhesion exists between the iris and cornea

* See also THE OPHTHALMOSCOPE, September, 1907.

(*soudure de Knies*). Should the latter be present, however, simple resection of the sclera can still be carried out. But in this case the knife, before engaging itself in the tendon of the ciliary muscle, cuts the adhesion itself—that is to say, the iris, so that after the operation there remains a breach in the iris which resembles a dialysis of the greater circle. I have performed this section on more than one occasion involuntarily whilst practising sclerecto-iridectomy. The accident need not deter us. If it happen in cases where we desire to execute a simple sclerectomy, we practise the sclerectomy and leave the iris in place with its opening at the level of the greater circle. The breach matters little, since it is hidden by the upper eyelid.

The simple sclerectomy described above must not be confused with the operation recommended by Bettremieux (*La Clinique Ophtalmologique*, 1907, and *Société Française d'Ophtalmologie*, 1908*). Bettremieux contents himself with thinning the sclera by excising from it layers external to the canal of Schlemm. Personally, I believe this thinning to be altogether inadequate and capable of yielding nothing, for although the resulting cicatrix is perhaps thin, yet it is assuredly very dense, with the consequence that filtration at its level is either imperfect or altogether absent. The question is not one of thickness but of density: one sees staphylomatous eyes of which the wall of the staphyloma is extremely thin and of which nevertheless the tension is very high.

Under any circumstances, whatever may be the result of the operation recommended by Bettremieux, my operation does not resemble it in any particular. My aim is to excise the whole thickness of the sclera, and in that way to produce a true *fistulette*, since, with Rochon-Duvigneaud, I believe that the filtering cicatrix is neither more nor less than a *fistulisation* of the eye. This fistula, moreover, may remain invisible to the naked eye. For it may consist in one or more microscopical apertures, of which histology will some day reveal to us the precise formation and intimate structure.

Observations.

In order to demonstrate that simple sclerectomy is feasible without danger of entanglement and that a filtering cicatrix results from its performance, I report the following observations:—

Case No. 1.—Mme. C——, 69 years, a nervous subject affected with inherited gout, consulted me at the beginning of November, 1907, on account of her right eye, in which for several months she had experienced the premonitory signs of glaucoma, as shown by coloured circles, temporary obscurations, and intermittent sensations of fog. Pilocarpine, purgatives, potassium iodide, and the abundant use of milk failed to prevent the situation from becoming worse, and on December 11th the patient resigned herself to operation. Her state was then as follows: R.V. *plus* 1.75 D. = $\frac{1}{2}$. T. *plus* $\frac{1}{2}$. L.V. *plus* 1.25 D. = 1. T.n. Right optic disc slightly excavated. Visual field somewhat contracted above and within. Simple sclerectomy after repeated instillations of adrenaline, eserine, and cocaine. Operation attended by no difficulty. The iris remained perfectly in place. Patient left the *maison de*

* See page 818 of the present number of THE OPHTHALMOSCOPE.

santé a week after the operation. The anterior chamber was then re-formed, and there was a very small subconjunctival *fistulette*, with notable ampulliform elevation. The patient was again seen at the end of January. Her visual acuity was equal to 2/3, tension was normal, and there were no complaints of the phenomena in the right eye, from which the patient suffered prior to operation.

Case No. 2.—E——, notary, 45 years, of Salles (Gironde). A very nervous subject, affected with diabetes, without real arthritic antecedents other than some disseminated neuralgias, notably a facial neuralgia which had persisted for several months. Two years ago, the patient had commenced to experience some trouble with his left eye. Before seeing me, he had consulted several ophthalmic surgeons, who had diagnosed simple chronic glaucoma, and had proposed operation.

The patient directed particular attention to the contraction of his visual field below and inwards. He experienced also intermittent attacks of foggy vision, during which he suffered some little pain in the left side of the head. He was very uneasy about his condition.

I saw this patient for the first time in June, 1907. Pilocarpine and a suitable general treatment were prescribed, but without result, and on January 9th, 1908, the condition was as follows: R.V. = 1. T.n. L.V. = 2/3. T. *plus* $\frac{1}{2}$. Right visual field normal. The left field was contracted, especially inwards and below (inwards, 10°; outwards, 50°; above, 25°; and below, 20°). Chromatic sense good. On January 9th, simple sclerectomy was performed, according to the usual rules, without accident. Eserine was instilled twice every day during eight days. During the course of the treatment I noted on the fifth day that the pupil, small and circular, had became a little distorted upwards, which made me dread an entanglement. By insisting upon eserine this passed away. The patient left the *maison de santé* on January 18th with the anterior chamber re-formed and a filtering cicatrix acting well. July 2, 1908.—Patient seen nearly six months after operation. His visual field had gained about 10 degrees in all directions. Vision equalled 1. The patient was much pleased with the result of the operation The narrow filtering cicatrix was readily seen.

Case No. 3—Marie E———, housekeeper, 51 years, without notable diathesis, has had from infancy slight corneal blemishes. For several years coloured circles have been seen with the right eye, and she has experienced occasional headaches. The woman is not much inconvenienced by the reduction in visual acuity, since on account of the corneal blemishes, the sight has always been mediocre, but she complains of the contraction of the field of vision. Treatment by pilocarpine produced no improvement. *May 18th*, 1908.—R.V. *plus* 2D. = $\frac{1}{4}$. T. *plus* I (feeble). L.V. *plus* 3D. = 1/3. T.n. Irregular astigmatism in each eye, due to the corneal changes. Visual field of the right eye: 20° within; 35° without; 15° above; and 15° below. Glaucomatous excavation. The anterior chamber is not very deep, and the irido-corneal angle is relatively little accessible. On this day (May 18, 1908) after the use of cocaine and eserine, simple sclerectomy was practised on the right eye. The iris was button-holed, owing to an adhesion between the iris and the cornea. Otherwise, the operation was executed correctly, and yielded a very regular filtering cicatrix. The anterior chamber took a long time to re-form, a process not completed, indeed, until June 1st. The sensations of fulness of which the patient complained had disappeared, and the field of vision had become a little larger. This patient belonged to that group in which prolapse of the iris is to be dreaded, on account of the notable hypertension of the eye. It is possible that the tiny breach made by the knife through the greater circle of the iris preserved her from that complication, by preventing the aqueous humour from accumulating behind the iris.

Case No. 4.—M. L———, a chemist at Brives, 57 years, without noteworthy diathesis but having led an active life crammed with emotions and overwork, had noticed eleven years ago the first symptoms of glaucoma, which had shown themselves after a great disappointment, and were most pronounced in the morning after the patient had passed a bad night. Sight failed in both eyes, somewhat more quickly in the left than in the right eye. Treatment had been followed for two years, when one of our most eminent ophthalmic surgeons made a definite diagnosis of glaucoma, at the same time prescribing myotics, notably an oily collyrium of eserine, and advising against surgical interference.

When I saw the patient for the first time at the end of April, 1908, he had been unable to read or to write for two months. R.V. *minus* 3 D. = $\frac{1}{15}$. L.V. = 1/100, not improved by glasses. The left eye was useless, since its visual field was reduced to a small dormer-window (*lucarne*) in the outer part. As regards the right eye, the field of vision is very narrow and typical of chronic glaucoma. Measurements are:

12 within; 60 externally; 12 above; and 12 below. The colour sense is pretty good. T. *plus* ½. *May 11th*, 1908.—In the presence of the patient's son, an *interne* of the Paris hospitals, simple sclerectomy was performed upon the right eye. The operation was without accident, and before long a very excellent filtering cicatrix was established. On May 19th, the anterior chamber was re-formed, and the man left the *maison de santé* with a very obvious improvement of sight, and a cicatrix which is represented in the accompanying figure (Fig. 1.) On July 4, 1908, R.V. *plus* 0·75 D. and *minus* 3=¼. With *plus* 0·75 D. and *plus* 2 D. the patient was able to read the ordinary print of a journal, and he has commenced to write his letters once again.

Case No. 5.—Mme. F ——, 72 years, of Cognac, arthritic and nervous, has noticed for a long time the ordinary symptoms of glaucoma. The sight of the right eye had fallen, the visual field had contracted, and there were intermittent attacks of foggy vision. I saw the patient for the first time in April, 1908. The diagnosis of glaucoma was easily made, since the patient presented all the signs of that disease, including nasal contraction of the visual field and excavation of the optic disc.

FIG. 1.

Treatment by myotics. The results however, were scarcely appreciable. Encouraged by the excellent results of simple sclerectomy, this operation was proposed to and accepted by the patient. On May 20, 1908, R.V. = 1/15. T. *plus* ½. Visual field much contracted within, and especially above and below: within, 30°; externally, 60°; above, 10°; and below, 10°. Obvious excavation of the optic disc. Patient experienced no actual pain, but at certain moments was conscious of a feeling of weight in the eye and surrounding parts. On this day sclerectomy was performed in the presence of Dr. Bellot, médecin principal de la marine, sous-directeur à l'école de santé de Bordeaux. The operation was performed without accident. The patient remained under observation for a fortnight. From the sixth day the anterior chamber was re-established and a perfect filtering cicatrix was formed. The latter is represented in the accompanying figure (Fig. 2.) The patient insisted how well she felt; the sight was improved; and the eye was slackened. August 7, 1908.—The visual field has gained 5 degrees, and the acuity of vision has increased from 1/15 to 1/4.

Remarks.

The patient who forms the object of my sixth case has been operated on too recently (June 27th, 1908) for the observation to

be usefully reported in this place. But I may say that in him, as in the other five patients, everything went off well, and when he was discharged on July 6th last, the anterior chamber was re-established. The publication of the case will lose nothing by being delayed.

I recognize that the facts here brought forward are too recent to be fully demonstrative as regards the value and the duration of the filtering cicatrix. They are printed solely with the idea of showing that simple resection of the sclera is as feasible as it is easy in cases of chronic, simple glaucoma. In addition to this, they suffice to prove that the presence of the filtering cicatrix reacts most favourably upon the visual acuity. How, indeed, could it be otherwise when tension falls at once to normal?

FIG. 2.

The facts now brought forward are adequate to show the possibility and even the facility of simple sclerectomy when the eye is little or not at all distended. That is my sole aim on the present occasion. To terminate my communication it will be sufficient to indicate precisely those cases of chronic glaucoma in which one should perform sclerecto-iridectomy and those in which simple sclerectomy is indicated.

My opinions have been characterised as too sketchy. I recognize that schemas lack flexibility when one wishes to include within them all cases met with in the *clinique*, but they have the advantage of being precise and, in a particular case, they respond to the great need of clearness of which I am an advocate.

Conclusion.

In order to make myself clearly understood, therefore, I say that in the treatment of chronic glaucoma the indications for surgical intervention may, in my opinion, be formulated as follows :—

In cases where tension ranges from normal to 1 (feeble), simple sclerectomy after the careful employment of adrenaline, eserine, and cocaine. Eserine should be continued until such time as the anterior chamber is re-established. In cases where tension ranges from 1 to 3, sclerecto - iridectomy is indicated. Under such circumstances, the iris must be be excised, for the purpose of avoiding entanglement. This iridic excision, however, is much the least important part of the operation, and the making of a filtering cicatrix should, before all, be the aim of the surgeon desirous of ameliorating or of curing, as far as such is possible, a chronic glaucoma.

SYDNEY STEPHENSON.

REVIEW.

SOME OF THE NEWER REMEDIES IN EYE WORK.*

BY

SYDNEY STEPHENSON,

LONDON, ENGLAND.

7. **Potassium chlorate.**—This salt has been praised by Koster[1] as a local application in superficial affections of the eye, either dusted into the eye or used as a 3 per cent. solution. It has also been recommended in the treatment of epithelioma of the eyelid by William Zentmayer[2]. The salt was thoroughly rubbed into the floor and edges of the ulceration, first freed from dried secretion. To begin with, the application was made daily, and later every other day. Definite improvement from the end of the first week. Result excellent. Zentmayer's observation recalls the method employed by Bergeon long ago for rodent ulcer. A saturated solution of potassium chlorate was applied to the lesion, and, in addition, five grains of the chlorate were administered three times a day. Speaking of Bergeon's method, Swanzy[3] says :—"by aid of it remarkably good cures, even though not always permanent ones, can be effected."

REFERENCES.

(1) Koster.—*Archiv. f. Augenheilkunde*, June, 1900.

(2) Zentmayer, W.—*Ophthalmic Record*, August, 1907.

(3) Swanzy, Henry R.—*A Handbook of the Diseases of the Eye*, 8th edition, 1903, p. 213.

*A lecture delivered in the Post Graduate Course of Ophthalmology in the University of Oxford on 11th July, 1908.

8. Sal ammoniac in corneal opacities.—Pick[1], of Königsberg, has advocated a solution of ammonium chloride as a means of clearing up corneal opacities. The application is contra-indicated in recent opacities and also when the eye is reddened. One to three teaspoonfuls of the chloride are mixed with a cupful of boiled water, and the liquid is applied three or four times a day by means of an eye-bath. In the following case, which occurred in the reviewer's practice, the effects of the treatment were somewhat striking. Thomas F——, 50 years, came under notice on August 19th, 1906, with a dense leucoma, which covered the whole of the left cornea save for a peripheral strip, not wider than 1 mm. Iris not adherent; vision equal to hand-reflex. T.n. The condition had been the outcome of a septic ulceration treated with the cautery two years previously. No evidence of lacrymal or nasal mischief. An iridectomy was done down and out, and a good piece of iris removed right up to the root. On February 6th, 1907, treatment by ammonium was commenced, the liquid being applied for twenty minutes night and morning. On July 17th, 1907, a note was made to the effect that the surgical coloboma had for the first time become visible. Improvement continued; the leucoma became less dense; and sight improved. On April 4th, 1908, the iridectomy—coloboma was visible in practically its whole extent, and sight was good enough for the patient to find his way about with his left eye, a thing he had been unable to do since the original ulceration. The central part of the leucoma was then tattooed, with the result that vision rose still higher during the next six weeks, after which the patient passed from under observation.

As the result of chemical experiments, Guillery[2] found that albuminate of calcium, to the deposition of which in lime burns the corneal opacity is largely due, is soluble in a solution of ammonium chloride. Accordingly, he tried to remove such opacities experimentally produced in animals' eyes by cauterisation with quicklime. Finally, he treated a severe lime burn in the human eye by means of ammonium chloride, 2 per cent. to 20 per cent., applied to the eye by means of a bath, continued for half to three-quarters of an hour daily. After twenty-two days of this treatment, the leucoma had become reduced in size and in density, and sight had risen from hand-movements close to the face to the ability to count fingers at 70 c.m.

References.

(1) Pick. *Centralbl. f. prak. Augenheilkunde*. Juni. 1908.
(2) Guillery.—*Archives of Ophthalmology*. 1907. p. 675.

9. Injections of Alcohol.—Injections of alcohol have been employed for the cure of: 1. angioma of the conjunctiva; and 2. blepharospasm.

1. H. Gifford[1] cured an angioma, $\frac{1}{4}$ inch thick, extending from the caruncle to the fornices and cornea, but not invading

the palpebral conjunctiva or the skin, by injecting on several occasions two or three drops of absolute alcohol into the substance of the tumour.

2. In the course of 1905 Valude[2] reported the instantaneous cure of two cases of *tic non-douloureux* by injection over the stylo-mastoid foramen of 1·5 cc. of 80 per cent. alcohol with a little added cocaine. One injection only was employed in each instance. The injection, as usual, was followed by temporary facial paralysis. In one of Valude's patients the spasm had lasted for three and in the other for ten years. Abadie and Dutemps[3] reported a successful case in a woman of 56 years, in whom unilateral facial spasm had persisted for sixteen years, and for five years had been so severe that she had been compelled to give up her occupation, that of a dressmaker. de Speville[4] reported the cure of hemifacial spasm in a woman of 62 years after the injection of 1 cc. of 80 per cent. alcohol with 1 cc. of stovaine. Noceti[5] treated with success three cases of clonic hemi-spasm by the injection of from 1 cc. to 1·5 cc. of 80 per cent. alcohol, containing from 1 cc. to 1·5 cc. of cocaine hydrochloride. The injections numbered two or three. Valude[6] has recently reported three cases of blepharospasm cured by alcohol injections, and has taken the opportunity to discuss the question of the treatment of the condition by alcohol. Valude has now replaced the cocaine used formerly by stovaine. One cc. or 1·5 cc. is the proper amount of the liquid to inject, and the point of the needle should be moved gently to and fro while the fluid is being injected in the neighbourhood of the exit of the facial nerve from the stylo-mastoid foramen.

REFERENCES.

(1) Gifford, H.—*Ophthalmic Record*, December, 1906.
(2) Valude. *Annales d'Oculistique*, décembre, 1905.
(3) Abadie and Dutemps.—*Archives d'Ophtalmologie*, février, 1906.
(4) Spéville, de.—*La Clinique Ophtalmologique*, mai 10, 1906.
(5) Noceti.—*Archives d'Ophtalmologie*, novembre, 1907.
(6) Valude. *Annales d'Oculistique*, avril, 1908.

10. Sodium salicylate.—Some remarkable reports have been published with regard to the effect produced by the internal administration of massive doses of sodium salicylate in cases of sympathetic ophthalmitis. Lindahl,[1] who treated seven cases with success in every instance save one, draws the following conclusions:—(1) In doses of 4 to 6 grammes daily the salicylate is the most efficacious remedy against sympathetic iritis or irido-cyclitis; (2) its effect is prompter and more certain than that of mercurial inunctions; and (3) it seems to give a milder character to traumatic irido-cyclitis. Lindahl's conclusions have recently been confirmed by Widmark.[2]

REFERENCES.

(1) Lindahl. *Svenska Medical Sociely*, February 9, 1904, and THE OPHTHALMOSCOPE, 1905, p. 195.
(2) Widmark, J. *Mitteil. aus der Augenklinik des Carol. Medico-Chir. Institutes zu Stockholm*, 1908. Ref. in THE OPHTHALMOSCOPE, p. 839 of the present issue..

General remedies.

The remainder of the reviewer's remarks may be grouped under the following heads :—

1. Radio-therapy.
2. Animal organo-therapy.
3. General anæsthesia.
4. Thiosinamin and fibrolysin.
5. Atoxyl.
6. Sero-therapy.
7. Hyperæmia.

1. Radio-therapy.

Attention has been recently paid to the treatment of affections of the eye and its appendages by radiations of various kinds, including those from electric lamps, X-rays, and radium.

As regards **photo-therapy**, L. Koch[1] obtained good results in some cases of keratitis and of serous iritis by exposing the eye twice a day for about five seconds to the light of an electric lamp of about 20 candle power. Some slight effect, also, was obtained in opacities of the cornea. Franks'[1a] experiences with the chemical rays of light in various forms of keratitis were encouraging. He employed the voltaic lamp of which the heat rays were arrested by passing the light through a saturated solution of copper sulphate. The eye was placed at the focal distance of a convex lens, by means of which the rays were concentrated. D. E. Sulzer[2] has attempted to resolve opacities of the cornea by exposure of the eye to the radiations from the arc-lamp of Broca-Chatain. The eye was placed at the conjugate focus of the arc-light formed by a quartz lens, which had a diameter of 40 mm. and a principal focal distance of 50 mm. The exposure varied from 20 to 90 seconds, but essentially depended upon the reactional suspectibility of the patient. Reaction was proportional to the length of exposure to the actinic rays. It supervened in from two hours to two days after treatment under the guise of redness of the eye, lacrymation, and lancinating pains. Sulzer found that interstitial scleroses of the cornea improved. He made the important observation that under the influence of the treatment, tension falls, pupillary exudations become absorbed, and posterior synechiæ undergo rupture. Nineteen cases were quoted in support of Sulzer's conclusions.

Following the example of Edgar Stevenson[3] and Holmes Spicer[4] in this country, Sulzer has treated corneal opacities by electrolysis, applied directly to the cornea by means of a bit of silver wire (1·5mm. in diameter), the end of which had been fused in a Bunsen flame to form a smaller or larger head. The positive electrode, applied to the nape of the patient's neck, was a large zinc *plaque*, enveloped in moistened washleather. The electrodes were in communication with a table containing the resistances

and measuring instruments, supplied by accumulators giving a current of 110 volts. During the application the voltmeter should register four to six volts. According to Sulzer, the results obtained from the electrolysis of nebulæ were good. The appearance of the eyes was always improved, but the bettering of sight was not so pronounced. At the same time, acuities below 1/10 were raised to 2/10 or 3/10, while acuities of 0·2 to 0·4 were improved to 1/10 or 2/10.

Reverting to light treatment, Herte[5] has given much attention to the treatment of ulcus serpens corneæ (hypopyon-keratitis) by that means. Of 547 cases experimented on, 26 were cured with the light rays, derived from a kind of modified Finsen lamp and an amalgam of cadmium and zinc, with an arc of 3mm. to 4mm. at 2·5 amperes. Exposure ranged from three to five minutes, and, as a rule, several sittings were required. Reaction was pronounced. It was noted, and the point is practically important, that the resultant scarring was very slight after the treatment of hypopyon-keratitis by irradiation.

X-rays, as well as **currents of high intensity,** have been widely employed in the treatment of diseases of the eye, sometimes with the best results. A note of warning, however, has been sounded by A. Birch-Hirschfeld[6] with regard to the use of these powerful agents in ophthalmic work. Unless used with proper precautions, they may, indeed, cause most untoward complications—as, for example, loss of the eyebrows and eyelashes, inflammation of the conjunctiva, cornea, and iris, and in the deeper parts of the eyeball such changes as degeneration of the macular region and ganglionic layer and vessels of the retina, and of the medullary fibres of the optic nerve. Birch-Hirschfeld therefore urges that the eyeball should be efficiently protected, and that exposure should neither be unduly long nor repeated too often.

The list of diseases that have been treated with the X-rays is already a long one, and includes: (1) rodent ulcer and epithelioma of the eyelids, and sarcoma and other orbital growths; (2) trachoma; (3) tuberculosis of the conjunctiva; (4) spring catarrh; (5) blastomycetes; (6) scleritis, superficial and deep; (7) amblyopia; (8) blepharitis; and (9) glaucoma. We may glance at each of these subjects in turn.

(1) *Rodent ulcer, &c.*—The cure of rodent ulcer and of epitheliomata of the skin of the eyelids has gone far beyond the experimental stage. In this connection the reviewer will merely quote Sweet[7], who has treated upwards of twenty such cases, with success in every instance save two. Sweet is of opinion that in our present state of knowledge it is no longer justifiable to resort to the excision of rodent ulcers and epitheliomata of the eyelids. With regard to sarcomata, the position of the X-rays is not quite so clear. But an inoperable case of orbital sarcoma has been reported by Webster Fox[8] where restoration to the normal followed forty-six exposures to the focus-tube. Kienbock[9] cured a sarcoma,

which had produced bilateral exophthalmia and optic atrophy, by thirteen exposures spread over the course of three months. Béclère[10], also, has reported a successful case.

(2) *Trachoma.*—Trachoma has been treated with X-rays by Mayou[11], Walsh and the reviewer[12], Cassidy and Rayne[13], Bettremieux[14], Goldzieher[15], Pardo[16], and Vassioutinsky[17], with results that, on the whole, compare most favourably with those obtained by the more ordinary methods. Walsh and the reviewer were the first to employ the high frequency current in this intractable disorder. The results were excellent, and cure was obtained, always without pain, and often in a surprisingly short time. It seemed to make little difference whether the current was applied directly to the diseased parts or merely transmitted to them through the closed eyelids. The tediousness of holding the lids everted, as well as the exposure of the nurse's hands, may be avoided by employing the ingenious little clip devised by Reid and Edmunds[18]. It should be said that some authors, as Webster Fox[19], who passed the current through the lid in trachoma, met with no success in twenty-one cases. Harman treated seven cases of trachoma, without improvement, by the high frequency current.

(3) *Tuberculosis of the conjunctiva.*—The reviewer[20] was the first to endeavour to cure this somewhat rare disease by means of X-rays. The patient, a girl, aged 4 years, was cured in a month, without visible cicatrisation of the conjunctiva, by thirteen exposures applied for ten minutes at a time, the tube being held six to ten inches away from the eye. Aubineau and Chuiton[20a] had a successful case which the actual cautery and silver salts had failed to cure.

(4) *Spring catarrh.*—Recoveries from spring catarrh from exposure to the radiations of the focus-tube have been reported by Starr[21], Bennett[22], and Allport[23]. The last-named first removed the palpebral outgrowths, and then exposed the conjunctiva, everted by means of a lid-clamp, to the X-rays. Cure followed eighty exposures.

(5) *Blastomycetes.*—The best cure for that singular disease, blastomycetes of the skin of the eyelids, instances of which have so far been met with almost exclusively in Chicago, U.S.A., appears to be by the local application of X-rays, together with the administration internally of massive doses of potassium iodide.

(6) *Scleritis, superficial and deep.*—Pardo[24] has treated scleritis by the X-rays, and he claims that "these rays represent a real discovery, inasmuch as up to the present day there is no other direct therapeutic agent, but only means amounting to a purely symptomatic treatment."

(7) *Amblyopia.*—Coover[25] has reported a series of cases of non-toxic amblyopia improved by the high frequency current, and Webster Fox[26] confirms "his observations in every detail."

(8) *Blepharitis.*—L. Webster Fox[19] applied the high frequency current to 100 cases of blepharitis, and found that "cure was rapid and apparently permanent." The patients were treated daily for two weeks with a spiral vacuum tube. Bunting[19a] cured a rebellious case of ulcerous blepharitis, following measles, after 24 exposures to the X-rays.

(9) *Glaucoma.*—Truc, Imbert, and Marquès[27], of the Montpellier school, treated a case of hæmorrhagic glaucoma (subacute), which iridectomy had failed to benefit, with the high frequency current—eleven sittings, each lasting from three to fifteen minutes. Coincidentally with a fall in the general arterial pressure, the eyes improved, and the patient regained sight enough to count fingers at several metres.

Radium, the element discovered by Curie in 1901, has been used rather extensively in the treatment of eye disease. The method has been simply to place a few mg. of radium bromide of varying degrees of uranium activity (U.) in a sealed glass tube, and to apply the little apparatus close to or over the eyelids for a given time. An interval of some weeks is allowed to elapse before a second application is made. Two points stand out clearly: first, that radium is simpler to apply than the X-rays; and, secondly, that it may be used with comparative impunity about the eye. At the same time, our knowledge of the therapeutic values of the *alpha*, *beta*, and *gamma* rays respectively may be said to be almost non-existent. The *gamma* rays appear to be identical with the X-rays, and it is possible that the therapeutic results obtained from radium are more closely connected with them than with the other emanations, known and unknown, notwithstanding the fact that radium is believed to give off a very small proportion only of these exceedingly penetrating rays.

The conditions in which radium has been employed may be classified in the following way:—(1) epithelioma, rodent ulcer, and nævi of the eyelids; (2) trachoma; (3) relapsing inflammations of the uveal tract; (4) various painful affections of the eye and surrounding parts.

(1) *Epithelioma, etc.*—With regard to rodent ulcer as it affects the skin of the eyelids, there can be no doubt whatever that radium is directly curative, and that without pain, as witness successful cases reported in this country by J. Mackenzie Davidson[28], Sichel[29], A. S. Green, and others. This method of treatment, although by no means rapid in its results (as in a case of the reviewer's), has obvious advantages as compared with surgical measures. An important communication on this subject was that published by J. Mackenzie Davidson in the XXVI volume of the *Transactions* of the Ophthalmological Society of the United Kingdom (1906), in which he described the results obtained by radium in fourteen cases, of which twelve were instances of rodent ulcer. The end of the radium tube was

placed in contact with the diseased part during a period of from twenty to forty minutes, and was held in position by some simple contrivance, as a clamp or a strip of rubber plaster. No further application was made for a month or six weeks. Reaction, in the shape of redness and increased secretion, usually followed some eight days after the application, and if the latter had been unduly prolonged, an erysipelatous blush, and even high temperature and sickness, might result. In Mackenzie Davidson's cases, the results of which were strikingly successful, the number of applications ranged from one to twelve, and averaged 5·5. Nævi have been treated successfully with radium in several cases by Justus[30]. Sarcoma of the eyelid has disappeared under the influence of the same substance. Thiébault[31] effected a cure of epithelioma of the face after eight applications of thirty minutes each at intervals of seven days. It may be noted that one of Davidson's cases was a recurrent epithelioma, cured by two applications of radium.

(2) *Trachoma.* — Hermann Cohn[32] cured three cases of trachoma by means of a crystal of radium bromide, enclosed in a thin glass tube, the end of which was employed to touch each trachoma-body from ten to fifteen minutes daily. The observation has to some extent been confirmed, and, indeed, even antedated, in this country, although it may be noted that N. B. Harman[33] obtained no improvement in two patients upon whom he experimented, although 37 applications were made in one and no fewer than 139 in the other. On the other hand, C. Beck[34] and Selenersky[35] have been successful in the radium treatment of trachoma. Thiébault[31], too, has used radium with success in very severe cases of trachoma, with or without pannus. Lastly, Falta[36] successfully dealt with three cases of trachoma by massage with the bulb of a glass tube which contained radium.

(3) *Inflammations of the uveal tract.*—Charles H. Williams[37] obtained a considerable improvement in a case of uveitis by one minute applications of radium (1,500,000 U.), carried out for about four months two or three times a week, with occasional intermissions. Williams also saw benefit follow the employment of radium in two other cases, namely, ulcer of the cornea and acute iritis with turbidity of the aqueous humour.

(4) *Painful affections of the eye.*—Darier[38] has made the important observation that the metalloid is capable of relieving pain when applied to the eyelids in such affections as rheumatic iritis, specific choroiditis, orbital neuralgia, and so forth. This result now and then came about from a single application of radium of 240 U. for one or two hours. Besson[39] confirmed Darier's observations so far as regards the pain of rheumatic iritis, traumatic irido-cyclitis, and epibulbar carcinoma.

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2. Animal Organo-therapy.

In 1896 W. H. Bates,[1] of New York, familiarized surgeons with the effects of an extract of suprarenal capsule upon the eye by showing that a 1 per cent. solution acted simply and solely as a powerful vaso-constrictor. The observation did not attract much attention, mainly because the suprarenal was difficult to procure and not easy to maintain in an active state. But such experiments as were made confirmed Bates's assertions. Since then, as we all know, adrenaline chloride has been introduced by Takamine, and placed on the market by Messrs. Parke, Davis, & Co., thus putting at our disposal a convenient, cleanly, and active preparation of suprarenal body. More recently, three substances, *viz.*, "renoform," "hemisine," and "paranephrin" have been introduced as cheap and convenient substitutes for adrenalin. "Renoform" is a

fluid extract of the active principle of the suprarenal bodies, manufactured by a firm of Berlin chemists. Goldschmidt[2] recommends it as an economical, active, and non-irritating substitute for adrenaline, which, truth to say, is somewhat costly. "Hemisine," one of Messrs. Burroughs, Wellcome, & Co.'s preparations, is described as "a derivative of the suprarenal gland, and is put up in ophthalmic tabloids, each of which contains approximately 1/100th of a grain." One of these tiny tabloids dissolved in ten minims of water forms a solution of 1 in 1,000. "Paranephrin," a product of the Merck firm, is a stable 1/1,000 solution of paranephrin in 0·6 per cent. solution of common salt. Polte[3] has conducted careful experimental trials of the Merck product, the action of which is that of suprarenal extracts in general. Finally, the firm of Meister, Lucius, and Brüning, Ltd., have introduced what is called "synthetic suprarenin," a substance that is indistinguishable as regards both physical qualities and physiological action from adrenaline. In other words, it is an efficient preparation.* It keeps well, and may be boiled before use.

From what has been said it will be obvious, then, that we are now in possession of several trustworthy suprarenal preparations, British and foreign.

It was at first believed that the intense vaso-constrictor action of the new agent might be turned to advantage in the treatment of superficial affections of the eye. But as J. A. Menzies[4] has said: "congestion is nature's attempt to remove the cause of a conjunctivitis by a free flushing with blood and lymph. To use adrenaline in such a case, without at the same time attacking the disease, is to thwart nature's attempt at cure without introducing an alternative attempt. The use of adrenaline in such a case is therefore a confession of helpless ignorance." In fact, experience now shows that the main use of adrenaline must be sought in directions other than the relief of actual disease. The agent, it is true, does exert a good influence upon spring catarrh, a condition somewhat rare in England, but common enough in some other countries. Perret[5] a few years ago claimed that in the frequent use of adrenaline we had a means of curing the conjunctival condition, and his claim has been more or less confirmed by Darier[6]. Harold Grimsdale[7] has reported in THE OPHTHALMOSCOPE two cases cured by the application three or four times a day of a 1 in 2,000 solution of adrenalin chloride. The reviewer, however, is convinced that the agent is no specific for spring catarrh, despite Perret's claims. The subjective symptoms, it is true, frequently improve under adrenaline, but, in his experience, it is rare for the objective signs

* At the same time it should be said that W. E. Dixon (*Pharmaceutical Journal*, April 18, 1908) has shown that a fresh solution of natural suprarenin is almost twice as active as a fresh solution of the synthetic substance. The proprietors of the latter, however, on the authority of J. Biberfeld, of Breslau University, have challenged the accuracy of Dixon's observation (*Chemist and Druggist*, May 23, 1908, p. 814).

to undergo much change. He can recall one instance only where definite cure came about under this method of treatment. A girl, 11 years of age, first seen on September 18th, 1905, with the history that her right eye had been inflamed in the autumn for three successive years. On examination, the eye manifested the limbal and palpebral signs of spring catarrh, of no especial severity. Adrenaline hydrochloride, 1 : 2,000, was prescribed for use to the eye three times a day. On June 25th, 1906, the patient again attended with the statement that the eye had been inflamed for five days. No palpebral changes could be found, and the sole objective finding was ciliary redness. On July 2nd, 1906, practically no evidence of spring catarrh could be obtained from examination of the eyes. That was the last note made.

In glaucoma, also, adrenaline is certainly not devoid of power. Grandclément[8] has insisted upon the fact that it is capable of curing glaucoma without operation, provided the disease has not lasted long enough to produce organic changes, and, further, that the drug, combined with physostigmin, be used frequently, say, every half hour for several days. The same author has improved sight in a case of infantile glaucoma by the following collyrium : — eserin, 0·50 ; adrenalin, 1 : 1,000, 3 ; distilled water to 10. At the same time it must not be forgotten that A. F. MacCallan[9] has reported five cases of glaucoma in which adrenaline, caused an increase in tension, an observation confirmed in two cases of glaucoma by A. Senn[10]. The result, however, is unusual, and, as MacCallan himself admits, it would be unfair to lay undue stress upon the fact.

The fact should be mentioned that the reckless employment of adrenalin has been known to produce failure of sight and softness of the eyeball, the latter lasting, as in Grandclément's case, for several months. Its injection (combined with cocaine) led in a case reported by Bouchart[12] to infiltration of the cornea and defect of sight persisting for several months. Instances of local necrosis following the injection of suprarenin have been related by Stargardt[13] in two cases of excision of the lacrymal sac under the local anæsthesia produced by 1 per cent. cocain and eight drops of suprarenin. When the dressing was removed on the third day, all the parts that had been infiltrated were found to be white, insensitive, and necrotic. The final outcome, however, was good. A singular experience with adrenalin occurred in the practice of David de Beck[14]. A patient was affected with posterior synechiæ, as the result of specific iritis. About half an hour after the liberal use of adrenalin, 1 : 1,000, the eye became painful and the sight dim from hæmorrhage into the anterior chamber. Post[15] has noted dilatation of the pupil follow the use of adrenalin in glaucoma and in a case of keratitis. The reviewer has used adrenalin less frequently than he once did, after reactionary bleeding took place into the anterior chamber after four successive eyes had been anæsthetised by cocaine and adrenalin prior to the operation of iridectomy.

At the same time there can be no doubt that adrenalin renders the parts more or less bloodless when operating for squint, an important point, especially if the reviewer's plan of lengthening instead of dividing the tendon be adopted.* It is a fact that when the eyeball is markedly reddened, as in acute iritis, atropine will act better upon the pupil if combined with adrenalin than if used alone. According to R. Mengelburg[16], there is a danger in that very fact, inasmuch as symptoms of atropine poisoning are all the more apt to be set up. It is thought that the lumen of the lacrymal passages is widened by constriction of the vessels, so that the passage of atropine from the conjunctival sac is facilitated.

Josué found that atheromatous degeneration may be produced in the aortæ of rabbits by the intravenous injection of adrenalin. Valude and Duclos[17] have carried out experiments to ascertain whether the prolonged use of adrenalin locally is capable of setting up comparable changes in the vessels of the conjunctiva or eyeball. They found that daily instillations of 1 : 1,000 adrenalin continued for $3\frac{1}{2}$ to 5 months can produce a slight lamellar thickening around the superficial conjunctival vessels of the eyes of rabbits, but the change goes no deeper. They believe that adrenalin can be freely used, except in cases where there is a tendency to subconjunctival hæmorrhage.

To sum up, adrenalin has shown itself to be of service in the treatment of spring catarrh and glaucoma, as an adjuvant to atropine, eserine, and fluorescein, and, finally, as a local hæmostatic before the performance of some operations on the eye, especially squint.

In addition to suprarenal extract, two other animal extracts have been employed in eye work, namely, "didymine" and "optocine."

Didymine, or testicular substance, has been given internally in locomotor ataxy. Lloyd Roberts has reported several cases of exophthalmic goitre relieved by its administration, one to five 5-grain tabloids (Burroughs, Wellcome, & Co.) being administered several times a day. Testicular extract has been put to a curious and out-of-the-way use by L. Dor[18], who gave the product to five children in whom symptoms of asthenopia were associated with rapid bodily growth. Growth was retarded, and, incidentally, asthenopia improved.

"Optocine" is the name given to a potent extract from the retinæ of freshly-slaughtered animals. It is advised in various forms of retinal exhaustion—as, for example, tobacco amblyopia,

*Cohn (*Woch. f. Ther. u. Hygiene de Auges*, November 24th, 1904) has experimented with a new combination of cocaine and adrenaline, which goes under the name of "Eusemine." It contains, in addition to the two alkaloids mentioned, chloretone and physiological salt solution. It is most useful as a local anæsthetic in eye operations, and may be injected beneath the skin or conjunctiva. Ideler (*Therapeutische Monatshefte*, July, 1907), who has employed eusemine, by instillation or injection, in one hundred minor operations on the eye, states that the results were almost always satisfactory.

retinitis pigmentosa, and in myopic choroiditis. The dose of the liquid is one drachm two or three times a day. Robert W. Doyne[19] was the first to bring this novel product under the notice of the medical profession. In this place the reviewer will merely say that "optocine" does appear to expedite recovery in tobacco amblyopia, although it is difficult in that, as in some other diseases that tend to self-cure, to estimate remedies at their correct value. As a matter of some little historical interest, it should be pointed out that extracts from various parts of the eye were employed by Dor in 1897, by Lagrange in 1898, and by Darier in 1900.

For centuries in Russia the popular remedy for night-blindness has been raw liver substance taken by the mouth. v. Sicherer[20] has reported a case in which night-blindness was cured in about one week by giving the patient 300 to 400 grammes of cooked liver daily. In German East Africa, Fabry[21] treated night-blindness in a mountain guide in a similar way. The condition underwent a striking improvement in three days. Two hundred grammes of raw sheep's liver were administered daily. The reviewer would point out that in London, where mild xerosis conjunctivæ and night-blindness are not uncommon in poor children during the summer months, cod-liver oil is almost a specific for the complaint.

The treatment of Graves' disease by Moebius's "antithyroidin"—the blood-serum of rams from which the thyroid gland has been removed, with 0·5 per cent. of added carbolic acid—need scarcely be described in this place, and a similar remark applies to the extract of thymus vaunted by Dor *père*[22] in the treatment of the same affection.

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3. General Anæsthesia.

Since the introduction of cocaine by Koller in 1884 there has been a growing disinclination among many ophthalmic surgeons, more especially perhaps in Germany, to operate under general

anæsthesia if it can possibly be avoided. This tendency is reflected in recent papers by O. Meyer, Terrien, Zimmermann, Bruns and Robin, and Siegrist. All of the writers named advocate enucleation of the eyeball under local as opposed to general anæsthesia. The exact details of the method differ, as might be expected, in the hands of the different men. For example, Meyer[1] instils cocaine and then injects deeply at four points Schleich's No. 2 solution, which contains cocaine hydrochloride, 0·10, and distilled water, 15. Several drops of adrenaline, 1 : 1000, are added to the cocaine if the eyeball be inflamed. Terrien's[2] plan is more complicated. Superficial anæsthesia is secured by means of cocaine or stovaine, 4 per cent., to which adrenaline, 1 : 1000, is added in case the eyeball is inflamed. Four deep injections are then made of a sterilized solution of cocaine or stovaine (1 : 150). The parts are rendered analgesic in this way by using about half a drachm of the liquid. Terrien next injects one centigramme of morphine beneath the skin of some part of the body. The operation is then commenced by dividing the conjunctiva and the recti tendons. By means of an Anel's syringe, provided with a curved and blunt needle, half a c.c. of the following solution is injected around the posterior pole of the eye, and after waiting for three or four minutes, the optic nerve is divided and the eyeball removed; cocaine and morphine hydrochloride, of each 0 gr. 01 : stovaine and sodium chloride, of each 0 gr. 02 : distilled and sterilized water, 5. Zimmermann[3] injects thirty drops of a 1 per cent. solution of alypin, combined with adrenalin, into four different points in Tenon's capsule, after the previous instillation of a few drops of alypin into the conjunctival sac. Bruns and Robin[4] employ a mixture which contains ten drops each of a 4 per cent. solution of cocaine and adrenalin chloride (1 : 1000) and twenty drops of normal saline. Every forty drops of the admixture therefore includes 2/5 grain of cocaine. Ten drops of the solution are injected deeply—behind the equator of the eyeball along each rectus muscle. An interval of five minutes is allowed to elapse before operation is begun. According to Bruns and Robin, the advantages of local anæsthesia are: 1. the consciousness of the patient, thereby affording a safeguard against removing the wrong eye (*sic!*); 2. the safety to life; and 3. the fact that most of the patients seem to prefer local anæsthesia (*sic!*). Siegrist[4a] instils cocain and adrenalin, and then injects, above, below, and to the inner and outer side of the eyeball, 0·75cc. of a 2 per cent. solution of novocain and adrenalin. Operation is commenced one or two minutes afterwards, and it is claimed that even inflamed eyes can be removed without pain in this way.

G. F. Suker[5] has suggested that the new method of general anæsthesia by injections of scopolamin and morphin may be useful in acute glaucoma and cataract in nervous subjects. He adopts the method of Blos and Korff, which is as follows:

gr. 1/50 of scopolamin hydrobromide and gr. ½ of morphin sulphate are dissolved in three drachms of distilled water. One Pravaz syringeful of this mixture is injected into the arm two-and-a-half hours before operation; a second similar injection is made one hour later; and the third one hour after that, *i.e.*, half an hour before the time set for the operation. The patient, who meanwhile should be kept perfectly quiet, becomes drowsy and sleepy soon after the first injection, and when the third injection is given he is scarcely sensitive to pain, although still somewhat responsive to touch. Anæsthesia is usually complete within half an hour after the third injection, but should that fail to be the case, a very minute quantity of chloroform or of ether is administered. For ophthalmic operations, two injections often answer, provided a little cocaine has been placed in the eye. There is practically no stage of excitement in this method of anæsthesia. Patients seldom realise that they have been taken from their bed. Post-operative pain is uncommon. The patients rest well for from 15 to 24 hours after operation. Vomiting, retching, or restlessness is rare.

Segelken[6], also, is a strong advocate of the same procedure. He employs a product called "Scopomorphin" prepared by Riedel, of Berlin, which contains scopolamin hydrobromide, gr. 1/50; morphin hydrochloride, gr. ½; distilled water, 30 drops. One-third of the solution is injected three hours before operation, and one-third an hour and a half later. It is rarely necessary to inject the remaining third. The operation is done as soon as the patient is in a deep sleep—if desirable, after a little cocaine has been dropped into the eyes. Segelken has adopted the method for four years, and in his practice it has replaced general anæsthesia, except in young children.

It must be recognized that scopolamin-morphin-chloroform anæsthesia is by no means devoid of danger to life. This point has been brought out by Whitacre[7], who has adopted the plan in 40 cases. He notes a mortality amounting to 4 in 2,400 cases, and believes that the deaths were directly due to scopolamin.

Gallenga[8] adopts a modified plan, which will doubtless recommend itself to many ophthalmic surgeons. One hour before chloroform is administered he injects scopolamin (1 m.gr.) and morphin (1 ct.gr.). By this means the period of excitement is lessened, vomiting is avoided, and but little chloroform is used.

The advantages of infiltration anæsthesia in eye work have been urged by Stutzer[16] who has employed the method exclusively, and prefers it to general anæsthesia. He uses 0·5 per cent. to 1·0 per cent. cocaine in normal saline, with the addition of one drop of adrenalin to each c.c. of the solution.

To A. Loewenstein[17] we are indebted for a novel suggestion, namely, the induction of regional anæsthesia by the injection of cocaine in the neighbourhood of the lenticular ganglion with the object of reaching the long and short ciliary nerves by means of

which the entire eyeball is supplied with sensation. The body in question, which, as everybody knows, lies on the outer side of the optic nerve near the back of the orbit, is reached by means of a strong needle, 5 cm. in length, which is pushed along the lateral wall of the orbit for a distance of 4.5 cm. 1½ to 2 syringefuls of 1 % cocaine, with a little added adrenaline, are by these means injected in the vicinity of the lenticular ganglion, and the eyeball and the surrounding parts are rendered anæsthetic a few moments after the little operation. Half-an-hour before the injection, morphine (0.01g.=about ⅙ grain) is administered subcutaneously, for the purpose of calming the patient's apprehensions. Loewenstein has performed eighteen enucleations and seven exenterations under ganglion-anæsthesia as described above.

At the same time the reaction against general anæsthesia has assuredly gone too far, when we find Haab[9] taking what strikes the reviewer as an altogether exaggerated view of the dangers attendant on every form of general narcosis. It will, of course, be admitted that if an operation on the eye can be done painlessly under local anæsthesia, so much the better, on account of the preparation needed, the time consumed, the possibility of vomiting, the deep anæsthesia, the risks incurred, and, last but not least, the difficulty of securing the services of an experienced anæsthetist. Haab, however, advises against general anæsthesia on account of its danger to life. If his views were accepted generally the present generation would be denied one of the greatest blessings ever bestowed upon mankind, namely, the possibility of undergoing the most severe operations without the least suffering. It is obvious that a certain percentage mortality must attend the giving of any general anæsthetic, be it chloroform, ether, ethyl chloride, nitrous oxide, or any other. Accidents will become less numerous as training in the giving of anæsthetics becomes more general. It is, however, simply a misuse of words to say, as G. F. Suker[5] has done, that general anæsthesia produced by any agent is "a source of imminent danger to the life of the patient." When all is said and done, the danger in skilled hands is a small one, and the reviewer seriously questions whether the trifling risk incurred justifies us from withholding from our patients the boon of general anæsthesia.

In point of fact, a general anæsthetic is almost indispensable in certain operations on the eye — as, for example, acute glaucoma. In children, again, there are few operations that can be done with comfort to the surgeon or with safety to the patient under local anæsthetics, for in them it is not pain so much as fright that has to be avoided. Until recently chloroform was the favourite anæsthetic, probably because it was generally available, kept well,* and called for no complicated apparatus, like ether,

* The suggestion of Breteau and Woog (*Gazette des Hôpitaux*, 3 janvier, 1907) with respect to the decomposition of chloroform into hydrochloric acid and phosgene under the influence of light and air, does not appear to be generally known. The authors suggest that a disc of elder-pith, stained with Congo red, should be kept in the chloroform. On the occurrence of decomposition, the red of the pith indicator becomes changed to blue.

liable at any moment to get in the operator's way. Doubtless, chloroform or ether will remain the anæsthetic for such operations as require a period of prolonged unconsciousness. For brief periods of anæsthesia, however, such as suffice for most operations upon the eye, ethyl chloride* is the best agent, as the reviewer has pointed out elsewhere[10]. Valude[11] has also spoken highly of ethyl chloride for operations on the eye requiring only a short period of narcosis. B. Hird[12] tells us that ethyl chloride has largely replaced gas and to some extent chloroform as a general anæsthetic at the Birmingham and Midland Counties Eye Hospital. With ethyl chloride a patient may be anæsthetized, operated on, and recover all within five minutes, an economy of time that will be appreciated by all who have to work in a busy out-patient department. Preliminary preparation, however, should not be neglected, since the after-effects of the anæsthetic, as Chaldecott[13] insists, depend very much upon whether the patient has or has not been properly prepared for the administration. Ethyl chloride is speedy, relatively safe, easy to give, and produces a flaccid anæsthesia free from muscular twitchings, so embarrassing to the ophthalmic surgeon. Vomiting, in the reviewer's experience, is generally due to an overdose.

A longer period of anæsthesia may be obtained by giving a second dose of ethyl chloride, or, much better, by continuing the inhalation with chloroform or ether. Gendron and Servel[14] recommend ethyl chloride followed by chloroform. By this sequence they claim that there is less excitement and shock' that little chloroform is used, that accidents are rare, and that recovery is rapid. Two hundred and fifty patients had been anæsthetized by this plan. The reviewer, after some considerable experience, can speak highly of the ethyl chloride chloroform sequence, *when administered by a competent anæsthetist.* The saving of time is great, the anæsthesia good, vomiting rare, and recovery rapid. It is a method of general anæsthesia that may be recommended in ophthalmic work.

But it must be admitted that the maintenance of quiet anæsthesia during operations on the eye is often a matter of some difficulty. For this, as Frederick W. Hewitt[15] has pointed out, there are three main reasons ; first, the position of the patient, so that the mucus and saliva flow backwards and induce reflex disturbances ; secondly, fluctuations in the depth of the anæsthesia, owing to the anæsthetic having to be intermitted from moment to moment to meet the requirements of the operator ; and, thirdly, the fact that the eyes are often not available as guides. As Hewitt remarks, " there have been a large number of chloroform fatalities in ophthalmic

*Fromaget (*Annales d'Oculistique*, 1901, p. 196, and *Bull. et Mém. de la Société Française d'Ophtalmologie*, T. xviii, 1901, p. 517) was the first to advocate the employment of ethyl chloride in eye work.

practice, and the explanation of the fact is probably to be found in these considerations."

Apart from this, the sooner it is generally recognised that the induction of anæsthesia is a matter requiring the undivided attention of one really skilled in the administration of anæsthetics the sooner will ophthalmic surgeons be in a position to appraise the method justly. In this country, as matters stand (*Lancet*, May 30, 1903), it is possible for a medical man to commence work "without any practical knowledge and experience of anæsthetics." Few examining bodies require evidence of instruction in anæsthetics, and none holds a special examination in that subject. The result of this official neglect is sometimes painfully obvious. A succession of incompetent administrators is enough to daunt the stoutest operator. In these cases the anæsthetist counts for much, and the particular anæsthetic for comparatively little. Until every ophthalmic hospital and department avails itself to the full of the services of a skilled administrator, the reviewer ventures to suggest that eye surgeons will be scarcely in a position to view the question of general anæsthesia in its true perspective.

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4. Thiosinamin and Fibrolysin.

Thiosinamin (allyl - sulpho - urea) is formed by warming oil of mustard with an alcoholic solution of ammonia. Internally or subcutaneously it has been used with the idea of procuring the absorption of pathological fibrous tissue. For example, it has been employed in such conditions as stricture of the urethra, rectum, œsophagus, and pylorus, cicatrices following burns, keloid, Dupuytren's contraction, rhinophyma, and the adhesions of chronic arthritis. Ten years ago G. F. Suker[1] reported good results in cases of exudative choroiditis and corneal opacities from the administration by the mouth of 1½ to 3 grains a day of thiosinamin. The reviewer[2] employed the drug with some slight

success soon after Suker wrote. More recently K. H. Grunert[3] has tried the effect of thiosinamin in several cases of cicatricial ectropion and post-neuritic atrophy of the optic nerve. He injects (at first daily and then at longer intervals) 0·5 to 1·5 c.c. of the following solution: thiosinamin, 4·0; glycerin, 8·0; distilled water to 40·0. Grunert also suggests that the method might be of service in the treatment of vitreous opacities. Pick[4] has obtained good results in leucomata by the subconjunctival injection of thiosinamin, while Brandenburg[5] tried the remedy by means of intra-muscular injection in various kinds of corneal opacity, with inconclusive results.

Thiosinamin itself is not very soluble in water (1 in 18), and its solutions are unstable, while the injection of an alcoholic solution is apt to be painful. These several drawbacks have led to the introduction of "Fibrolysin," a compound of thiosinamin with sodium salicylate (Mendel). The newer remedy is freely soluble in water, and appears to be a more active preparation than the older. It causes, moreover, no pain when injected into the muscles. It is supplied by Merck, of Darmstadt, in ampullæ, each of which contains 2·3 c.c. of 15% sterilized aqueous solution (=0·2 grm. of pure thiosinamine).

Domenico[6] has experimented with fibrolysin in leucomata following hypopyon-keratitis, the corneal infiltrations of trachoma, specific papular iritis, and exudative choroiditis, in all of which affections he has obtained good results. The injections, given daily or every other day, ranged in number from ten to eighteen. They caused neither pain nor local infiltration. They were made into the muscles of the gluteal, dorsal, or lumbar regions. A diuretic action and an improvement in the general health were observed to follow their employment.

Windmüller[7] has employed fibrolysin and dionine locally, one to three times a day, in the treatment of various kinds of corneal opacity. He reports encouraging results. J. Galezowski[8], who has used a 5 % to 15 % aqueous solution of the syrupy mass formed by mixing thiosinamin and antipyrin in twenty-six opacities of the cornea, had in nine a notable amelioration, and in eleven a sensible improvement. In the remaining six cases the condition remained without appreciable alteration. The medicament is applied for five minutes to the eye once or twice a day.

Injections of fibrolysin, which are well borne by patients, would seem deserving of serious consideration in such affections of the eye as corneal opacities, posterior synechiæ, cicatricial trachoma, and retinitis proliferans.

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5. Atoxyl.

Atoxyl, an organic arsenic compound which includes 37·69 per cent. of arsenic, occurs as a white, odourless powder, one part of which is soluble in six parts of warm water. It has been successfully used in the treatment of sleeping sickness in man. According to Boyce[1], Dr. Livingstone, the famous African explorer, first employed arsenic as a remedy against trypanosomiasis, and found that it had a beneficial action upon animals infected with "Nagana," or tsetse-fly disease. R. Koch[2] considers that atoxyl is as much a specific for trypanosomiasis as quinine is for malaria.

The similarity between the causal organisms of sleeping sickness and of syphilis and the effect of atoxyl upon the former disease have led to a trial of the remedy in syphilis. In France it has been used under these circumstances by Salmon, Hallopeau, and Guiard, and in Germany by Lassar and Hoffmann. Reports are almost unanimous as to its value in syphilis.

As regards ocular syphilis, atoxyl has been employed by Darier[3] in two cases of iritis, by Bargy[4] in a case of specific iritis, and by H. Gifford[5] in several conditions, including sympathetic ophthalmitis, trachoma, and interstitial keratitis. In reference to the last-named disease, Gifford found atoxyl in a couple of cases do good, "but not in so pronounced a way that the experiment was at all conclusive." But in an addendum to his communication, Gifford mentions a third case where atoxyl "produced an unusually favourable result."

The writer of the present review has now enjoyed a considerable experience of atoxyl in the treatment of cases of interstitial keratitis due to inherited syphilis, and has obtained results that he has never got in any other way, although he has known for years that Donovan's solution sometimes yielded remarkably good results. Doses of 0·25 to 0·50 gramme have been injected beneath the muscles of the buttock once, twice, or oftener in the week, and in many instances mercury with chalk, gr. 1 three times a day, has been given as well. The combination has appeared to him to be almost a specific for some of the cases. When larger doses (0·75 to 1·5 gramme) were employed, as at first, attacks of epigastric pain, sometimes accompanied by vomiting, were not uncommon soon after the injection. Now, however, such are seldom seen with the smaller doses.

The following is typical of several other cases :—Leona L——, 14 years, first seen on September 25th, 1907. Four years ago both eyes were stated to have been bad for about a month. On the present occasion both eyes got inflamed a month ago, one shortly after the other. *On admission* :—Typical and severe bilateral parenchymatous keratitis. R.V. 1/60. L.V. 2/60. Forehead "bossy," with transverse constriction above eyebrows.

Café au lait complexion. Upper central incisors and all four first permanent molars show specific characteristics. Patient treated with mercury and chalk, gr. 1 thrice a day, until February 20th, 1908, without striking improvement. Since that date, twelve injections deeply into the buttock of atoxyl, 1 c.c. to 2 c.c. of a 1 in 6 solution being used on each occasion. After the last injection, made on April 8th, 1908, sight had risen to 5/12, while the patient could read with ease No. 1 type on Jaeger's scale. There were faint corneal opacities, and some tendency to episcleritic redness of the left eye. On May 23rd, 1908, R. V. = 5/12 and No. 1 Jaeger; L. V. = 5/9 partly and No. 1 Jaeger. Faint scattered nebulæ, more marked in right eye. No redness. Hirschberg vessels right cornea. No synechiæ, but a few pigment dots on left lens. The improvement after injections spread over less than two months, and numbering twelve in all, can in this case be described without exaggeration as "extraordinary."

In severe or intractable cases, the injections are made three times a week, until a dozen, in all, have been made. In milder cases one injection a week is given, in addition to the ordinary treatment. The total amount injected should not exceed 6 grammes. An improvement in general health often takes place coincidently with the cure of the keratitis.

Although atoxyl is said to be a relatively non-toxic product, yet it should be employed with circumspection. It is, in reality, a powerful remedy. One of Hoffmann's[6] patients developed albuminuria after four injections, each of 50 c. gr. Large doses may cause, indeed, abdominal discomfort, nausea, vomiting, and diarrhœa. These drawbacks, moreover, are by no means the most serious that have been reported. In fact, disturbances of sight of a permanent nature have been known to result from atoxyl. The onset may be sudden, and the trouble manifests itself by reduction of the visual acuity, contraction of the visual field, and, sooner or later, by pallor of the optic disc and narrowing of the retinal vessels. Symptoms of general intoxication need not necessarily co-exist. Isolated cases of this unfortunate kind have been reported by Bornemann[7], Krudener[8], Fehr[9], Terrien[10], and Nonne[11]. In Nonne's case the condition was found to be due not to interstitial optic neuritis but to a parenchymatous degeneration of the fibres of the optic nerve. More striking are the facts adduced by Kopke[12] and by R. Koch[2] respectively. Kopke[12] in 29 cases of sleeping sickness treated with atoxyl, noted six instances of bilateral optic atrophy. R. Koch's experiences are even more conclusive as to the dangerous nature of large doses of atoxyl. He observed 22 cases of blindness (without ophthalmoscopic signs) after injections of 1 gramme of atoxyl for the cure of sleeping sickness. Such a thing had never been seen when the dose of atoxyl did not exceed 0·5 gramme.*

*For an account of disturbances of sight produced by atoxyl, the reader is referred to Morax's review in the *Annales d'Oculistique* for January, 1908, p. 75.

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6.—Sero-Therapy.

Much interest has centred around the treatment of certain diseases of the eye, as diphtheria of the conjunctiva, hypopyon-keratitis, tuberculous affections, and pyogenic invasions, by means of specific sera, and recently Sir Almroth Wright's vaccines (streptococcal and staphylococcal) have been pressed into service. Instances of the successful employment of the Wright vaccines have been published in The Ophthalmoscope by H. Grey-Edwards[1] and Ernest Maddox[2] respectively. As regards sera, one of the most interesting points, specially insisted upon by Darier[3], of Paris, is that they are non-specific—in other words, that it is almost a matter of indifference what particular product be used in the treatment, say, of a streptococcal ulcer of the cornea. This view, which is the outcome of clinical as opposed to laboratory knowledge, although opposed to all we have been taught, nevertheless appears to be justified by experience. Darier has cured hypopyon-keratitis by the accidental injection of anti-diphtheritic serum; Giorelli and Brinda[4] cases of streptococcal stomatitis and of gonococcal vulvitis by the same serum. In this country, J. P. Parkinson and W. S. Fenwick[5] have used with success rectal injection of a polyvalent antistreptococcus serum (Burroughs, Wellcome, and Co.) in the treatment of several affections of gonorrhœal origin—as, for example, arthritis and pyæmia. The reviewer himself has used the polyvalent serum with encouraging results in the treatment of gonococcal conjunctivitis both in newly-born babies and in older subjects. Another case in point is that of Fromaget[6] who has reported a couple of cases of purulent ophthalmia, accompanied by false membrane and due to pneumococci, both of which were cured within 48 hours by injections of anti-diphtheritic serum. Teulières'[7] thesis is devoted to proving that sera possess no specific action, so that in cases of hypopyon-keratitis antidiphtheritic serum yields as good results as can be obtained from Römer's antipneumococcic serum.

The important subject of sero-therapy, however, has been so ably treated by Percival J. Hay, of Sheffield, in the July number of THE OPHTHALMOSCOPE, that the reviewer feels that nothing further need be said in this place.

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7.—Hyperæmia in Eye Work.

August Bier,[1] of Bonn, treated many conditions, inflammatory and otherwise, by his method of inducing hyperæmia of the affected parts. Attempts have been made to apply the *Hyperämie als Heilmittel* to ophthalmology, but so far without any conspicuous success, which is doubtless largely accounted for by the mechanical difficulties of inducing properly controlled hyperæmia in an organ having the anatomical situation of the eye. Renner[2] found that normal individuals subjected to congestion-hyperæmia by means of a rubber band around the neck, experienced after some hours a feeling of pressure and tension in the ocular muscles, especially when the eyes were turned far in one direction or the other. Moreover, the palpebral conjunctiva, and, to a less extent, the ocular conjunctiva, became red. Five case of keratitis diffusa were considerably bettered by a congestion of 6 to 12 hours daily for the space of two to four weeks. Ulcus serpens was not appreciably influenced. Ulcers of the cornea were not remarkably influenced. Roemer[3] also applied an elastic ligature around the neck. He experimented upon healthy persons for 3 to 8 hours daily, and found that the sole result was congestion of the conjunctiva. The plan was applied in various forms of disease. The results were gratifying in cases of interstitial keratitis. In five such cases, where congestion was employed from 6 to 12 hours daily, a decided improvement was noticed in from 2 to 4 weeks. The result, however, amounted to little in ulcus serpens and other forms of corneal ulceration, as well as in chronic opacities of the cornea. Robert Hesse[4] adopted a different plan. He employed a kind of cupping apparatus, of about 30 c.cm. capacity, applied over the eyelids. A rubber tube ending in a bulb of 50 c.cm. capacity was attached to the cup. A pressure of 20-50 mm. of mercury was readily got by this appliance. A favourable result was obtained in cases of interstitial keratitis, ulcus serpens, and hypopyon. Such was also observed in abscess of the lid, suppuration of the lacrymal sac, and hordeolum, but Hesse did not attach particular importance to these latter results. Hoppe[5] used an appliance

consisting of a glass cup, a rubber bulb, and a manometer. He studied thirty cases, and found the method, on the whole, to yield satisfactory results. The applications should be made by the surgeon himself for 15 to 30 minutes two or three times a day. The reviewer had an appliance similar to that of Hesse constructed. Applied over the closed eyelids it was easy by this appliance to produce œdema of the lids. Applied with the lids open, multiple ecchymosis of the ocular and palpebral conjunctiva could be brought about. In one case of traumatic ptosis (recent) the application produced traumatic emphysema. Finally, the appliance was abandoned owing to the practical difficulty of regulating the exact amount of suction, despite the manometer attached to the instrument.

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CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—IRIDO-CYCLITIS.

(1) **Straub, M.—On cyclitis.** (Over cyclitis.) *Ned. Tijdscrift voor Geneeskunde*, 1905, I, p. 181.

(2) **Aubineau.—Difficulties in the diagnosis of the syphilitic nature of iritis.** (Difficultés du diagnostic de la nature syphilitique de l'iritis.) *Annales d'Oculistique*, août, 1905.

(3) **Alt, Adolf.—Two cases of iritis in the course of Bright's disease.** *American Journal of Ophthalmology*, July, 1905.

(4) **Distler.—The ætiology of chronic irido-choroiditis in adults.** (Ueber die Ætiologie der chronischen Irido-chorioiditis der Erwachsenen.) *Die Ophth. Klinik*, July 5, 1906.

(5) **Michaeler.—Irido-cyclitic irritation following vaccination.** (Iridozyklitische Riezung nach Vakzination.) *Die Ophth. Klinik*, März, 1907.

(6) **Zentmayer, W. M.—Etiology of iritis.** *Therapeutic Gazette*, August 15, 1907.

(7) Chance, Burton.—Iritis in general disease. *Ibidem.*

(8) Risley, Samuel D.—Symptoms of iritis. *Ibidem.*

(9) Ziegler, S. Lewis.—The treatment of iritis. *Ibidem.*

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(12) Risley, S. D.—Prenatal irido-cyclitis; buphthalmos; inherited syphilis. *Ophthalmology*, July, 1908.

(13) Tooke, Frederick.—Hypopyon-iritis, associated with epidemic cerebro-spinal meningitis. *Ophthalmology*, July, 1908.

(14) Foster, Matthias L. — Diseases of the iris and ciliary body. *Annals of Ophthalmology*, July, 1908.

(1) **Straub's** communication contains a few remarks on clinical and experimental cyclitis. After infection of the ciliary body of rabbits, there is an infiltration of this part, and there are deposits of leucocytes in the vitreous, also on the retina and in the excavation of the disc. Descemetitis is seldom observed in rabbits; the author only saw some traces of it when the infection of the ciliary body had been brought about by passing a woollen thread, charged with tubercule bacilli, through this part. G. F. ROCHAT.

(2) **Aubineau** calls attention to the known fact that the syphilitic nature of an iritis cannot be absolutely inferred from the presence of so-called gummata (more correctly named condylomata), as these may be mistaken for tubercles or *vice versâ*. He considers that the only lesions which are pathognomonic of the syphilitic nature of an iritis are the papules of Desmarres, *i.e.*, small circumscribed spots on the iris, resembling hæmorrhages. He insists on the necessity of being on the look-out for a mixed cause, *e.g.*, syphilis and rheumatism. R. J. COULTER.

(3) Hardly deeming it necessary to refer to the scanty literature upon the subject, **Alt** informs us that he does not believe that it is astonishing that iritis should be met with in a disease in which the blood is vitiated as it is in Bright's disease. On the contrary, he thinks that it is rather astonishing that we do not meet more frequently with these cases. "Yet," he says, "I have so far only met with two cases, in both of which the iritis appeared considerably later than the retinal symptoms due to Bright's disease." His two cases emphasize the well-known fact that such patients but seldom live more than two years after the retinal signs of Bright's disease have made their appearance. In his

first, the time was even considerably shorter. He believes that as we acknowledge the existence of a diabetic and syphilitic, rheumatic and gouty iritis, we cannot deny the fact that there is also a Brightic or albuminuric iritis. C. A. O.

(4) **Distler** believes, that syphilis does not merit the prominent position given to it in the ætiology of chronic irido-choroiditis and feels inclined to attribute a great many cases to tuberculosis and to auto-intoxication. PERCIVAL J. HAY.

(5) **Michaeler** relates the following case: P.W., *æt.* 56, was vaccinated on the left arm. A fortnight afterwards, irido-cyclitis supervened in the left eye. There was no history of syphilis, gonorrhœa, tuberculosis, rheumatism, or influenza. The author thinks that there may be some connection between the affection of the eye and the vaccination. PERCIVAL J. HAY.

(6) **Zentmayer** points out how much our knowledge of the ætiology of iritis has extended. Whereas it is not long since we were content with syphilis and rheumatism as causes, at the present day the list includes also gout, tuberculosis, gonorrhœa, diabetes, nephritis, malaria, some infectious fevers, anæmia, auto-intoxication, sinusitis, in addition to trauma, sympathetic inflammation, and adolescence and senility.

(7) **Chance's** paper is directed towards the necessity of recognising the number of general diseases in which iritis may be present. Iritis in pyæmia may have been caused by the lodgment of an infected thrombus in the ciliary arteries. Intense iridocyclitis in a child with whooping cough was considered by Chronis, who reported it, to be due to an embolism in some portion of the eye. E. K. Campbell has suggested that iritis might be caused by infection from the mouth.

(8) **Risley**, after comparing the slow, subacute forms called serous iritis, uveitis, Descemetitis, and so on by writers, with acute plastic iritis, finishes his article with a thrilling account of the sufferings of a patient with the latter form of the disease.

ERNEST THOMSON.

(9) **Higgens** (London) makes a useful attempt to fix the symptomatology of gonorrhœal iritis. Every oculist will recognise the clinical picture, whether he can prove it to be the result of gonorrhœa or not. Some quotations from this paper will be useful. "The patient, nearly always a man, comes to the ophthalmic surgeon with iritis, and it is probably not the first attack. His age is generally over 30 . . . and he will give a history of gonorrhœa, often of repeated attacks . . . . : he may or may not have had so-called gonorrhœal rheumatism . . . . The iritis is severe; all the usual symptoms are well-marked. Its chief distinguishing features are: it is painful, often severely so, there are swelling of the iris, generally much photophobia, a strong tendency for adhesions to form, though there is no very great amount of exudation, with much ciliary and conjunctival congestion.

There are also a decided inclination to contraction of the pupil, which strongly resists the action of mydriatics, of which there is often a marked intolerance; a tendency to increased tension; a general intractability, rendering treatment most difficult and its results most disappointing; and an unlimited capacity for recurrences continuing through any number of years." The author goes on to suggest that in many men who have had gonorrhœa there is left for any number of years, in some part of the urino-genital apparatus, a very much attenuated virus, which, while not causing any local symptoms of gonorrhœa, is capable after absorption of causing inflammation in synovial membranes or in the iris. "In fact, it looks almost as if the iris becomes on occasions an excretory organ." In a similar way a woman may get an attack of salpingitis, not of ordinary gonorrhœa, as the result of infection from her husband who has had gonorrhœa in the past. Several cases are related, which all illustrate the tendency to recurrence and the difficulty in treatment. The author recommends iridectomy in all cases where recurrences are frequent, a line of treatment which is approved by most ophthalmic surgeons in iritis of this clinical type. Finally, under the heading "Remarks," Higgens suggests that gonorrhœa runs syphilis closely in the amount of general misery and suffering which is caused by it. Why should these things be? Gonorrhœa and syphilis are preventable diseases . . . . Venereal disease should be prevented. Syphilis and gonorrhœa should be made notifiable diseases.

ERNEST THOMSON.

(11) **Beaumont** (Bath) quotes cases of gonorrhœal iritis mentioned by Brodie (1834), Lawrence (1819), Travers, Astley Cooper, and Mackenzie (1854). Beaumont believes that "the interval which usually occurs between the gonorrhœa and the iritis probably explains the fact that the former as the progenitor of the latter is frequently overlooked." "As a consequence," he continues, "the iritis is fathered by chronic rheumatism or by some other putative parent." The modern conception regards gonorrhœal iritis as rare. The late John Griffith maintained that iritis might be observed not only as a complication but also as a sequel of gonorrhœa four to fifteen years after the latter, a conclusion questioned by Lawford. As the outcome of his experience of cases of iritis at the Royal Mineral Water Hospital, Bath, Beaumont, however, is inclined to agree with Griffith's views to some extent. During the last twenty years (1888 to 1907) the author has seen twenty instances of iritis at the institution in question, namely, two in women and eighteen in men. Syphilis, gout, and rheumatoid arthritis were mentioned comparatively seldom in the case-histories. Sixteen of the patients admitted gonorrhœa, and the author remarks "this seems to be a higher percentage than can be accounted for by other theories than cause and effect."

Beaumont concludes that gonorrhœal iritis is much commoner than some authorities are inclined to admit; that the connection between iritis and rheumatoid arthritis is less clear; and, lastly, that gout is seldom a cause of inflammation of the iris.

SYDNEY STEPHENSON.

(12) A baby of eight months was brought to **Risley** (Philadelphia) suffering from symptoms of congenital syphilis, together with blindness of both eyes (dating from birth) due to pre-natal iridocyclitis. Under the long-continued use of a mercurial bandage, the general symptoms abated. The right eye, however, took on the appearances of buphthalmia, but the left regained a measure of sight, despite the presence of complete annular synechia. When the child was aged twenty months—*i.e.*, after one year's mercurial treatment—iridectomy upon the left eye was necessitated by attacks of pain and tension. When the child had reached six years of age, the right (buphthalmic) eye was enucleated. Later, the sight of the other eye failed, and concurrently the patient became feeble-minded, although not devoid of certain traits of "erratic genius."

SYDNEY STEPHENSON.

(13) **Tooke** (Montreal) observed unilateral irido-cyclitis in an infant of two years on about the fifth day of an attack of what was diagnosed as epidemic cerebro-spinal meningitis. Death occurred on the same evening. The meningococcus was found during life in cultures from the cerebro-spinal fluid removed by lumbar puncture. Pathologically, the chief changes in the affected eyeball were found in the ciliary body and iris, both of which structures were much infiltrated by leucocytes. The fibres of the optic nerve were scarcely swollen, but there was a slight infiltration about the nerve-fibres near the lamina cribrosa. Micro-organisms, possibly representing Weichselbaum's diplococcus, were found in the tissue of the iris and also in exudation about Descemet's membrane. Organisms of an even more characteristic appearance were found in the space between the arachnoid and the dural sheath of the optic nerve. Organisms were apparently not discovered in the retina, although histologically that structure showed a slight infiltration by lymphocytes and polymorphonuclear cells. Tooke concludes that his case was one of acute purulent irido-cyclitis of metastatic origin, due to the diplococcus intracellularis meningitidis.

SYDNEY STEPHENSON.

(14) In the course of an *omnibus* article **Foster** (New York) deals with inflammations, tumours, and injuries of the iris and ciliary body. With rare exceptions an eye affected with iritis presents nothing indicative of the cause of the inflammation. Redness or swelling of the eyelids is unusual except in purulent iritis. Foster mentions incidentally a case of obstinate iritis associated with diabetes insipidus and cured by iron. In the treatment of iritis Foster recommends bathing the eye in the

hottest water that can be tolerated for at least ten minutes every two or three hours, and he attaches considerable importance to leeches placed on the side of the nose, about a quarter of an inch from the inner canthus, and not, as is more usual, on the temple.

SYDNEY STEPHENSON.

II.—SELF-MUTILATION OF THE EYES.

(1) **Lafon.—Ocular self-mutilation. (Les auto-mutilations oculaires.)** *Recueil d'Ophtalmologie*, octobre, 1907.

(2) **le Roux. —Two cases of severe ocular traumatism in insane patients. (Deux cas de traumatisme oculaire grave chez les aliénés.)** *L'Ophtalmologie Provinciale*, T. IV, p. 119, novembre, 1907.

(3) **Badal.—Ocular auto-mutilations. (Les auto-mutilations oculaires.)** *L'Ophtalmologie Provinciale*, T. V, p. 85, juin, 1908.

(1) **Lafon** describes the physical and mental state of a man who was suffering from melancholia with delusions of culpability and of having been ruined. He seems to have attempted to commit suicide by striking his head against a wall, strangling himself, and gouging his eyes out with his fingers. The injury to the eyes resulted in ecchymosis of the lids and conjunctiva, irregular wounds of the conjunctiva, hyphæma, *minus* tension, and complete loss of vision. A traumatic irido-cyclitis followed, the hæmorrhage and exudation became organised, and the globes eventually became atrophic. The author gives a short account of similar cases recorded, and discusses fully the mental state of self-mutilators and the motives of such acts.

J. JAMESON EVANS.

(2) **le Roux** describes the injuries inflicted upon themselves by two patients, who during attacks of insanity, attempted to tear out their eyes with their finger nails. The first case was seen once only after the infliction of the injuries when œdema of the lids and chemosis, with intra-ocular hæmorrhage, were present, but there was no rupture of either eyeball. In the second case the right eye was lost from panophthalmitis following rupture of the eyeball, while in the left there were ptosis and conjunctivitis, extensive cicatricial bands in the conjunctiva, pseudo-pterygium, symblepharon, and posterior synechiæ. R. J. COULTER.

III.—THE ORIGIN AND DEVELOPMENT OF TRACHOMA.

Greeff, Frosch, and Clausen.—Investigations on the origin and development of trachoma. *Arch. f. Augenheilkunde*, Bd. LVIII, No. 1, and Bd. LIX, No. 2, and *Archives of Ophthalmology*, July, 1908.

This important communication is divided into two parts, of which the first is by Greeff and the second by Frosch and Clausen. It will be convenient to consider them separately.

I.—**Greeff** (Berlin) comments upon the fact that recent communications on trachoma deal only with the statistics, the treatment, and the general management of the disease, and leave altogether on one side the clinical symptoms, the origin, and the course of the disorder. The view that all follicles in the conjunctiva are so many evidences of trachoma, however, has been given up. Many difficulties stand in the way of ascertaining the cause of the malady, such as the infrequency of obtaining, as material, recent and untreated cases, and the apparent immunity of the lower animals to inoculation with the virus. That the specific organism is yet to find does not justify the opinion of some authors, that no such organism exists. Greeff has applied modern methods to the investigation of trachoma—as, for example, the cultivation of anaërobic organisms, the study of structures that resemble tubercle bacilli, and, lastly, the employment of those plans of staining that enabled Schaudin and Hoffmann to identify the organism of syphilis (*treponema pallidum*). Yet the results have been negative. Lately, Greeff has been associated in his researches with Frosch and Clausen, a *résumé* of whose work is given in the next section.

II.—**Frosch** (Berlin) and **Clausen** (Berlin) found almost constantly in the secretion from cases of trachoma, and also in the contents of trachoma-follicles, extremely small diplobacteria. They stained by Giemsa, with dilute carbol-fuchsin and methylene blue, but not by Gram's method. As seen under a magnification of 2,000 diameters, they are described as infrequent cocci, usually arranged in pairs, and surrounded by a clear zone. They occasionally resembled small double bacilli. They occurred either isolated or grouped in the cells next to the nucleus. Control examinations of normal conjunctiva and of cases of follicular catarrh were always negative as regards these tiny bodies. Attempts to make cultures upon various media were unsuccessful. The authors point out that their findings agree with the earlier ones of Halberstädter and Prowazek* made in Java. Frosch and

* *Deutsche med. Wochenschrift*, 1907, No. 32.

Clausen have inoculated the eyes of man and of some of the lower animals with trachomatous virus, and the results are distinctly interesting. Two men were inoculated from cases of undoubted trachoma. The first subject, a man of 42 years, did not react. The second subject, a man of 22 years, manifested redness of, and discharge from, the eyes, together with swelling of the lids, soon after the inoculation. Ten days after the inoculation, the fornices were swollen and distinct follicles were present—in brief, a typical and severe acute trachoma was the result. Microscopically, trachoma granules are present on the thirteenth day after inoculation.

The inoculation of rabbits, guinea-pigs, and dogs was invariably negative, even when the eyes of the former animals had been irritated for several days by snuff, sand, and dust.

As regards monkeys, negative results followed experiments upon the lower apes (macacus). On higher apes (anthropoids) the inoculations performed by Halberstädter and Prowazek, Hess and Römer, and by Leber produced an inflammation of the conjunctiva, which in some instances resembled trachoma. Frosch and Clausen inoculated a pavian with discharge from a patient affected with trachoma, in which the characteristic parasites were present in the discharge and epithelial cells. No result followed in one of the monkey's eyes; but a rather purulent conjunctivitis developed in the second eye, the epithelium of which had been injured before the inoculation was carried out. No follicles were to be seen. As the result of these experiences the authors conclude that "the conjunctiva in anthropomorphic monkeys reacts to the virus of trachoma, but its development and the clinical picture vary when compared to the human." "Perhaps," they continue, "the infection is analogous with syphilis, to which the human is so susceptible and animals appear much less so."

SYDNEY STEPHENSON.

IV. THE EFFECTS OF ULTRA-VIOLET LIGHT UPON THE EYE.

(1) **Hess, C.—Experiments on the influence of ultra-violet light on the lens.** *Arch. f. Augenheilkunde*, Bd. LVII, No. 3, and *Archives of Ophthalmology*, May, 1908.

(2) **Birch-Hirschfeld.—An additional contribution to our knowledge of the injurious effect of ultra-violet light upon the eye.** (Weiterer Beitrag zur Kenntniss der Schadigung des Auges durch ultraviolettes Licht.) *Zeitschrift fur Augenheilkunde*, Juli, 1908.

(1) After glancing at the work of Widmark, Herzog, Birch-Hirschfeld, Hertel, Ogneff, and Strebel, **Hess** (Würzburg) describes his own study as to the influence of ultra-violet light upon the lens, carried out in 1906, in association with R. de Moraes. Schott's uviol mercury vapour lamp, which includes about four-fifths of all available ultra-violet rays, was employed. The intensity of the current was 3 to 3½ amperes. The animals, which included frogs, guinea-pigs, and rabbits, were placed at a distance of about 10 to 20 cm. from the tube, and exposed once or twice for from 1 to 16 hours. Some time after exposure, the eyes were enucleated, and placed in Zenker's solution. Surface and cross-sections of the lental epithelium were studied in about one hundred animals. In almost every instance the animals showed extensive and characteristic changes in the epithelium of the lens-capsule. In these respects no differences were noted between mammalian and non-mammalian lenses.

Slight opacities of the cornea were invariably present as the result of exposure to the ultra-violet rays. With regard to the changes in the lental epithelium, these may be conveniently summarized as follows :—1. mitotic figures ; 2. peculiar changes in the form of the nuclei of the cells ; and 3. degeneration and eventual destruction of the cells. No changes were observed in the lens fibres, possibly because the rapid clouding of the cornea acted as a mechanical protection. The cells of the lental epithelium of warm-blooded animals were not more sensitive to ultra-violet light than those of cold-blooded animals, although the regenerative processes were much more rapid and active. No differences in reaction were noted according to the age of the animal. The interposition of a pane of ordinary glass, not more than 1 mm. in thickness, between the source of light and the eye of the animal, appeared to prevent any degenerative processes, even after prolonged exposure. Hess does not attach importance to the ultra-violet rays as the cause of cataract after lightning-stroke, since the histological pictures of the latter condition are completely different from those after exposure to the rays. The mitoses he regards as representing, in the main, part of a regenerative process, and not as the direct result of the illumination (Widmark). In the ultimate analysis, all forms of experimental cataract (injury, naphthalin, ultra-violet rays) are due to a more or less extensive destruction of the epithelial cells, and this may be also true of glass-blowers' cataract, in which event protective glasses would assuredly be of service.

SYDNEY STEPHENSON.

(2) **Birch-Hirschfeld** (Leipzig) by experiments upon rabbits with the ultra-violet rays of an arc lamp, and with the iron light of a dermo-lamp, has found that light of short wave length has a pernicious effect upon the eye, affecting both its anterior region and also the deeper structures of the globe. The changes in the anterior portion include conjunctivitis, chemosis, muco-purulent

secretion, diffuse haze of the cornea, and hyperæmia of the iris. It is characteristic of this form of reaction that there is always a latent period between exposure to the noxious rays and the onset of the inflammation. Similar symptoms are seen in the human eye after exposure to ultra-violet light. The condition has been called *ophthalmia electrica*, and is seen after a stroke of lightning or a short-circuit flash. Snow-blindness and mountain-blindness are similar conditions. The deeper changes are due to the *chromatolytic reaction of the retina*, by which the pigment of the retinal nerve-cells is set free.

The author discusses the question as to whether a source of light rich in ultra-violet rays is really harmful to the eyes, and whether protective glasses should be worn by those who have to work by such a light. In many photographic processes a mercury vapour lamp of uviol glass is used, emitting a light very rich in ultra-violet highly actinic rays. The mercury vapour lamp is coming into use in many workshops, because it consumes little electrical energy and gives a diffuse light which does not cast heavy shadows. Birch-Hirschfeld has had five cases in which definite symptoms were produced in men who worked by this light, symptoms which he summarises as follows :—

(1) Conjunctival irritation with disturbance of the retinal functions, taking the form of a pericentral scotoma for red and green, vision remaining normal, and no fundus changes being present.

(2) In the diseased area, which was by preference a lower section of the field of vision (15^0—20^0 removed from the fixation point) and which was investigated by P. Smith's scotometer, blue, yellow, and white appeared to be unsaturated, whereas red and green were called "grey" or "whitish."

(3) In two of the cases only was central colour perception transiently disturbed, there being a slight diminution of the sensation of red and green.

All these symptoms disappeared when protective glasses were worn, even although the patients continued to work with the uviol mercury lamp. T. HARRISON BUTLER.

V.—CONGENITAL WORD-BLINDNESS.

Peters, A.—**On congenital word-blindness. Ueber kongenitale Wort-blindheit.**) *Münch. med. Wochenschrift*, No. 21, 1908.

Peters Rostock commences his paper with a historical survey, from which it appears that nearly all the work on congenital word-blindness has been done in Great Britain.

The author refers to the fact that Morgan's case, published in 1896, was the first to become generally known, and that

we owe it to the Editors of the THE OPHTHALMOSCOPE that Kerr has been given credit for publishing his cases a few months before Morgan. Kerr's paper did not appear in the ophthalmic journals, and hence escaped notice. After the publications of these two authors, several contributions appeared by Hinshelwood, whose name has been more or less associated with the condition, and Nettleship, Lechner, Stephenson, and Förster published cases. Subsequently, Thomas and Fisher pointed out that the complaint occurred in the form of a family affection, while Stephenson showed the hereditary nature of the condition particularly clearly in a series of six cases occurring in three generations of one family.* Other cases have been contributed by Claiborne, and by Variot and Lecomte. Peters comments on the singular circumstance that not a single case has been observed in Germany. While this statement has turned out to be not absolutely correct—two cases have been published by two German neurologists—Peters' case, which appears in this paper, is the first contributed by a German ophthalmic surgeon. It may be briefly described as follows :—

The patient is a boy, *æt.* 12 years, who comes from a healthy family in which there is no other evidence of the complaint. He is well-developed for his age, although rather small, and looks very intelligent. His progress at school, however, has been so slow that he has been kept in the same standard for four years. On examination, his eyes show only a slight amount of astigmatism. He can read the distance type—letters as well as figures—quite easily, but he hesitates and makes mistakes when given the reading type to read, although he can manage figures quite well. No mistakes are made when copying from a book, but they occur frequently when he writes to dictation. He commits serious blunders when reading a sentence he has written two minutes previously. He has not received any instruction in music, so that nothing can be said in this respect.

Mistakes are sometimes made in reading the last two figures of large numbers, *e.g.*, 87 instead of 78. He can do small sums quite readily, can sing pretty well, recite and draw, and describe the town of Rostock quite satisfactorily. There is no evidence of any motor or sensory disturbance, nor any sign of degeneration.

Peters describes another case about the nature of which he is rather doubtful. He gives particulars, however, because it illustrates the difficulties in diagnosis one may meet with when other mental deficiences complicate the case. The patient, a boy, *æt.* 11 years, whose family history shows mental weakness on the maternal side, is distinctly microcephalic. On account of frequent illnesses, he has been educated at home and has not been to school. He reads letters and figures quite well, but

* THE OPHTHALMOSCOPE, September, 1907.—Hinshelwood has reported four cases of congenital word-blindness in members of one family (*British Medical Journal*, Nov. 2nd, 1907.)—EDITORS.

hesitates in reading words and sometimes makes mistakes even with small ones. He copies very slowly, but reads what he has written fairly well. When easy sentences are dictated, he does not make any great mistakes. He is said to have a musical ear. He is interested in all that goes on in the house ; but is very slow in anything he does. The case was referred to Schuchardt, a neurologist, who regarded it as one of microcephalus with idiocy.

In returning again to the question, why nearly all the cases of congenital word-blindness have been described by English or American authors, Peters refers to Claiborne's suggestion that the difficulties of English pronunciation may be the explanation. He does not agree, although he thinks these difficulties may reveal the cases more easily.

As regards the ætiology of the affection, Peters accepts Morgan's view, namely, that it is congenital. He lays stress upon the hereditary cases observed by Thomas, Fisher, and especially by Stephenson, which indicate a circumscribed defective development occurring already in the earliest stages of embryonic growth. The theory derives further support from the fact that the hemianopsia so often seen in word-blindness is absent from these cases. The author recalls the congenital aplasia of the ocular muscles in which fibrous strands take the place of the muscles in some irregular manner and the congenital aplasia of the nuclear region which is productive of the most varied conditions —these and similar considerations lead him to say that we must not be content to record merely the well-defined cases, but look for allied disturbances which we must assume may possibly complicate this so-called word-blindness. In investigating such a case, questions should be put with regard to the reading of music notes and large numbers, and it should be remembered that just as a small coloboma may take the place of a microphthalmos in a family tree, so there may be cases in which the difficulty in reading is not so marked a feature, because it is overshadowed by symptoms associated with the defective development of some other part of the cortex. In this way perhaps we may be able to separate more clearly what is hereditary congenital aplasia from the vague term "degeneration." We may find that such cases as the second one described above should be included in the former group. The mentally deficient children will need to be examined more carefully. There may be cases in which the deficiency is limited to a certain part of the cortex.

As regards treatment, the author agrees with the opinion of English observers that these children must receive individual tuition. They should not be sent to schools for the mentally deficient, but to ordinary schools, while they are taught also individually at home. PERCIVAL J. HAY.

VI.—THE COUCHING OPERATION FOR CATARACT.

Axenfeld, T. — Sclero-corneal couching operation. (Scleronyxis anterior) after preliminary iridectomy. (Sklerocornealer Starstich nach vorausgeschickter Iridektomie). *Bericht der Ophthalmologischen Gesellschaft zu Heidelberg*, 1907: (Volume published 1908, p. 116.)

It is now admitted that there are cases of cataract which are better treated by depression of the lens than by extraction, but opinions vary as to the exact class of patient most suitable for this procedure. If one lens has been extracted and the eye has been lost from expulsive hæmorrhage, or from the loss of a large amount of very fluid vitreous, and if it be probable that similar conditions obtain in the second eye, or if from previous experience we know that they are present, then it is generally admitted to be safer to depress the lens than to extract it. There is some divergence of opinion which is the best method where there is a septic condition of the surrounding structures which cannot be entirely cured, as, for example, madarosis.

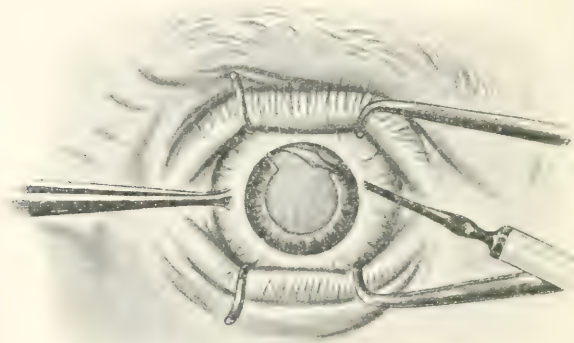
Axenfeld (Freiburg) considers that under these conditions extraction can generally be satisfactorily performed, but there are exceptional cases where couching is better.

Under any conditions, however, couching is a very repugnant operation to the modern surgeon; if only because at least 50 per cent. of the patients soon lose the sight they have recovered, either from glaucoma, irido-choroiditis, or detachment of the retina. Another factor brings it into disfavour: many operators are disinclined to undertake a manipulation they have never seen practised, and one which has to be done in the dark, so to speak. If the needle be inserted through the sclera, it must be passed behind the iris into the pupil, crossing the lens. The lens is often punctured, and it cannot be proved that this trauma has not some influence upon the production of the later complications, especially of secondary glaucoma. The reclination follows, necessitating serious disturbance of the eye, and breaking up of the vitreous with all that it entails. In spite of these considerations, Axenfeld has, during the last few years, had four patients who had lost an eye after extraction, and removal of the second lens seemed so hopeless that couching was regarded as the lesser evil.

One patient was a decrepit man of 80 years, with disordered intellect, who had already attempted suicide. His cataract was over-ripe, and the conjunctiva was in a septic state. Preliminary treatment did not bring the eye into a satisfactory condition for operating. The extraction (with iridectomy) under cocaine was a normal one, but after the lens was delivered, the cornea collapsed, allowing the wound to gape 2 mm. or 3 mm. There was no loss of vitreous. It was not thought wise to suture the

wound. Finally, staphylococcal panophthalmitis set in. The eye was removed, and under the same anæsthetic, a small iridectomy was made on the second eye. Although no cocaine was used (a drug which encourages the cornea to collapse), the wound gaped badly, but eventually healed. It was, however, obvious that the cornea would fall in after an extraction, just as the first had done. Extraction was therefore abandoned, and the lens couched. After the operation the patient was lost sight of, but Axenfeld found that he had died six months later, and that his sight had got worse again.

Axenfeld, instead of introducing the needle through the sclera, enters it at the limbus, and passes it close in front of the iris into the coloboma. It now pierces the zonula, and is placed upon the periphery of the lens. The needle is seen all the time, and the lens is not wounded (*see* figure). The most that is likely



to happen is that the capsule may burst at the equator. The lens is now pressed *downwards* by one or two firm movements of the needle; therefore *any disturbance of the vitreous will be of very slight degree*. It is not essential that the lens be depressed entirely out of the pupillary area; if at the end of the operation it be 4 mm. or 5 mm. below its original position, the coloboma will afford a sufficient pupil. In two cases the upper edge of the lens was only depressed as far as the upper margin of the original undilated pupil, but vision was good (V.=6/12—6/8).

A small iridectomy is made, preferably under a general anæsthetic and without cocaine, sometime before the reclination; it is the rarest thing for an iridectomy to be followed by infection or by expulsive hæmorrhage.

Axenfeld uses a cataract needle somewhat curved on the flat. In introducing it the concavity is directed forwards so that it is easy to avoid picking up the iris. When the pupil has been reached, the needle is rotated till the concavity faces backward

and passed into the coloboma. The flat of the needle is placed upon the lens equator, and with a lever-like action the lens is depressed. Two or three such movements generally suffice to dislocate the lens. It is absolutely essential to work *with the aqueous still in the anterior chamber*. If it flows away, it is better to postpone the operation.

Axenfeld cannot give statistics, for naturally few operations have been performed, but he thinks the permanent results will be better than after scleronyxis posterior. One patient had good vision after a year; two others have been treated so recently that no opinion can be given as to the final result. The fourth case has already been discussed. T. HARRISON BUTLER.

VII.—DETACHMENT OF THE RETINA.

(1) **Deutschmann, R.—Once more: "The treatment of retinal detachment." (Noch einmal: "Die Behandlung der Netzhautabhebung.")** *Beiträge für Augenheilkunde*, 67 Heft, März, 1907.

(2) **Dor, Louis.—Late results of the treatment of 25 cases of detachment of the retina. (Résultats éloignés du traitement de 25 decollements de la rétine.)** *Ann. d'Oculistique*, T. CXXXVII, p. 440, juin, 1907, and *Bull. et Mém. de la Société Française d'Ophtalmologie*, T. XXIV, 1907, p. 345.

(3) **Remak.— A case of detachment of the retina cured by a blow on the head. (Ein durch Kopftraume geheilter Fall von Netzhaut ablösung.)** *Centralbl. f. prak. Augenheilkunde*, September, 1907.

(4) **Maser, G. W.—Surgical treatment of detached retina.** *Medical Fortnightly*, October 25, 1907.

(5) **Paton, Leslie. — Detachment of retina treated by operation.** *Trans. Ophthal. Society U.K.*, Vol. XXVIII, Fasc. 2, 1908.

(1) **Deutschmann's** paper is, to a great extent, occupied by a polemic against Uhthoff and others. The points of practical interest with regard to the treatment which he advocates are as follows: in recent cases, as little interference with the ordinary life of his patients as possible, no pressure, no diaphoresis, only an occasional subconjunctival saline injection, as Deutschmann thinks that no treatment is practically as successful as a "pacific" one, and that the speedy gravitation of the subretinal fluid is altogether in the patient's favour. The surgical treatment which Deutschmann now advocates is transfixion, the

sweeping movements of the knife within the vitreous being omitted. It is quite essential to be sure of the patient's endurance, as the operation has generally to be repeated—it may be, up to fifteen times. Latterly, Deutschmann occasionally combines this treatment with cauterisation of the sclera, but without noticeable advantage. In desperate cases he still advocates injection of the vitreous of the rabbit, beginning with a diluted one. Of 220 eyes which he submitted to this treatment, 52 were cured (24.7 per cent.). R. GRUBER.

(2) Between 1894 and 1906 **Dor** (Lyons) treated 25 cases of detachment of the retina which appeared to him curable. These 25 patients received among them 150 injections into the capsule of Tenon, 150 applications of the artificial leech, 50 cauterisations, 10 punctures, and 3 electrolyses. The immediate results showed 12 cures, 4 improvements, and 9 failures, but 10 of the cures relapsed within a few months ; 5 completely and 5 partially, leaving the late results 2 complete cures, 9 partial cures, and 14 failures. The 2 complete cures are not yet three years old, but in both of them the eyes were kept under treatment for a year. Dor concludes that the reapplication of a detachment and restoration of the visual functions are stages in a cure, but do not constitute a complete cure, and that the treatment of a retinal detachment should be continued for five or six instead of for two or three months. R. J. COULTER.

(3) In a unique case **Remak** shows that occasionally things regarded as harmful may do good. The patient, a woman, 57 years of age, got a detachment involving the upper half of the retina in the right eye. This gradually spread downwards, as is usual, and in spite of some transitory benefit from a rest cure, remained the same for about $1\frac{1}{2}$ years. At this time while walking in the twilight and as a result of defective vision on that side, the right side of her head came into violent contact with a tree. She fell to the ground. There was considerable hæmorrhage. Following this accident, the eye gradually began to improve until within 3 months her vision became practically normal, and ophthalmoscopically the fundus was also practically normal. The explanation of this case is very difficult. The blow may have ruptured the detached retina and allowed the subretinal fluid to escape into the vitreous and the replaced retina might have been kept in position by organizing blood-clot. A. LEVY.

(5) **Paton** (London) reports a successful case of evacuation of the subretinal fluid by cautery, syringe, and Graefe's knife in a case of detached retina. V. before operation = 3/60, and several months after = 6/18. Age of patient, 50 years.

VIII.—OPTIC ATROPHY AND GENERAL OBESITY.

Sievert, H.—On the association of optic atrophy with general obesity in two siblings. (Ueber das Zusammentreffen von Sehnervenatrophie und Adipositas universalis bei einem Geschwisterpaar.) *Zeitschrift für Augenheilkunde*, Juni, 1908.

Sievert (Mannheim) publishes two cases which witness to the association between alterations in the pituitary body, on the one hand, and the general metabolism of the organism, on the other.

In 1897 Uhthoff, by publishing three cases, drew attention to the fact that acromegaly might be accompanied by loss of vision. Bartels then discovered another similar case. Fröhlich and Erdheim showed that general obesity might accompany tumours in the neighbourhood of the hypophysis cerebri. The two patients, shown in the inset photographs, came to the *klinik* at Königsberg in 1907. A.A., age 9, was brought for a strabismus

operation. She had squinted for seven years. She was found to have myopic astigmatism and a bad divergent squint. The optic nerve was atrophic. R.V. corrected = 5/25 partly. L.V. corrected = 5/50. In ordinary light, slight contraction of *nasal* side of fields. In dim light no hemianopic contraction but a

distinct concentric narrowing of the fields of vision. Colours perceived only centrally. Slight nystagmus. The brother of A.A., aged 15, has horizontal nystagmus, marked divergent strabismus (40°—50°). No hemianopic pupil-reflex. Grey atrophy of the optic nerve; small arteries. R.V. = fingers at 1/2 metre, L.V. = 1/25, not improved in either case. Slight concentric contraction of the fields. The child is colour-blind.

Both children are enormously fat, especially in the breast, abdomen, mons Veneris, and nates. No alterations in the bones. No glycosuria. No deformity of the sella Turcica seen in an X-ray photograph of the head. Family history—good. The points of interest in the cases are :— (1) The disease is a family one, a brother and sister suffering. (2) There is no ætiological cause. (3) As far as the facts go, it is impossible definitely to ascribe the condition to disease of the hypophysis. All the pathognomonic signs are absent. There is no deformity of the base of the skull in the neighbourhood of the sella Turcica, and no bitemporal hemianopsia. (4) The contraction of the fields in a concentric one. In one case the narrowing of the field was greater on the *nasal* side. T. HARRISON BUTLER.

IX.—NEUROPATHIC KERATITIS.

Davies, H. Morriston, and Hall. George.—The bacteriological aspects of the problem of neuropathic keratitis. *British Medical Journal*, 11 January, 1908.

This article by **Davies** and **Hall** deals first of all with the various theories which have been put forward to explain the origin of the keratitis which follows disturbance of the fifth nerve and Gasserian ganglion, namely, the purely trophic hypothesis, the trophic traumatic hypothesis, the vasomotor and the vasomotor traumatic hypothesis, the purely traumatic hypothesis, the desiccation hypothesis, and the mycotic hypothesis. These various theories are subjected to close criticism. The authors say, "As the arguments against all these hypotheses other than the mycotic appeared to us to outweigh those in their favour, and recognising, moreover, the great part played by micro-organisms in most progressive and relapsing inflammations, we decided to attempt a further investigation of neuropathic keratitis from the bacteriological aspect in the hopes of finding some organism which was constantly present only in those eyes which developed keratitis after trigeminal neurectomy, and which, by experimental inoculation into monkeys, would produce the condition." Twenty-one cases in which the Hartley-Krause operation had been performed for trigeminal neuralgia were

investigated. Of these 21 patients, 11 developed neuropathic keratitis, while 9 showed no affection of the cornea. In practically all the cases the *staphylococcus aurews* was found ; less frequently the *Staphylococcus albus*, *streptococcus*, *pneumococcus*, *xerosis*, and *proteus*. But there was also one other bacillus which was found only in those eyes which developed neuropathic keratitis. The authors call it *bacillus x*, describe its characteristics morphologically and in culture, and conclude that it belongs to the group of pseudo-diphtheria bacilli. Its characteristics agree very closely with those of the pseudo-diphtheria bacillus of Loeffler. It is to be found, the authors say, in 30 per cent. of normal people, which corresponds with the proportion of cases in which keratitis follows trigeminal neurectomy on the authority of various writers.

Experimental investigation of the *bacillus x* was made on monkeys by Sir Victor Horsley, for the authors. From the facts which they have ascertained clinically and experimentally (details of which must be sought in the original paper) the authors are led to suspect "that for the production of neuropathic keratitis three factors must be present : (1) removal of the Gasserian ganglion, (2) the presence of the *bacillus x*, and (3) a factor of undefined nature dependent on the eyelids and removed by closing them. (1) and (2) are not adequate alone, as suture of the lids prevents or cures neuropathic keratitis. (1) and (3) are not adequate alone, because keratitis only occurs after destructive lesions of the Gasserian ganglion when the organism is present and in the same proportion of patients as that in which the organism occurs in normal persons. The mode of action of the first factor is, of course, in no way elucidated by our investigations." ERNEST THOMSON.

X.—THE EXOPHTHALMOS OF ACROMEGALY.

(1) **Scalinci, N.—On the exophthalmos of acromegaly.** *Il Tommasi Giornale di Biologia e Medecina.* 1st year. Nos. 10-11, Naples, 1906.

(2) **Scalinci.—On the pathology of exophthalmos in acromegaly.** *L'Ophtalmologie Provinciale*, août et septembre, 1907.

(1) The following are the conclusions of **Scalinci's** interesting work, founded on one very well studied personal case and on the examination of analogous cases already published :

1. Exophthalmos is not a frequent complication of acromegaly ; it is encountered in about one in ten observations. 2. The principal characteristics are ; that the exophthalmos

is straight forward, usually bilateral, non-pulsatile, generally of slow onset, but often reaching a considerable degree; it is but little reducible, often subject to variations in degree, and never disappears. 3. The exophthalmos of acromegaly presents several of the characters of the exophthalmos of Basedow's disease, which entitles one to think of an identical pathogenesis. 4. This pathogenesis must especially be concerned with alterations of the walls of the orbital vessels by primary or secondary alteration of the cervical sympathetic. 5. The pathogenic theory of venous stasis by compression of the cavernous sinus is not confirmed by the most frequent clinical manifestations which accompany the exophthalmos of acromegaly. 6. Lastly the reduction of the orbital cavity by alteration of the craniofacial bones, or sudden exophthalmos by thrombosis of the cavernous sinus may exceptionally play a part in the pathogenesis of the exophthalmos of acromegaly. A. ANTONELLI.

(2) **Scalinci** considers that the exophthalmos which occurs in cases of acromegaly, and is typically bilateral, non-pulsating, and of slow growth, cannot be caused by changes in the bony walls of the orbit, by hypertrophy of the orbital adipose tissue, by spastic contraction of the smooth muscle-fibres of the orbit, or by stasis of the orbital veins from pressure of the enlarged hypophysis on the cavernous sinus, but must be due to neuropathic dilatation of the orbital vessels leading in time to permanent changes in their walls. R. J. COULTER.

XI.—SIMPLE ANTERIOR SCLERECTOMY IN GLAUCOMA.

Bettremieux, P.—Simple anterior sclerectomy regarded as a means of curing and preventing glaucoma. (La sclérectomie antérieure simple envisagée comme moyen de traitement curatif et préventif du glaucome.) *Bull. de la Société Belge d'Ophtalmologie*, No. 23, p. 36, 1908.

Bettremieux (Roubaix) describes his operation of so-called "simple anterior sclerectomy," an account of which originally appeared in 1907.* The operation is performed under cocaine, and adrenalin may or may not be used. After raising a flap of conjunctiva from the neighbourhood of the limbus above the cornea, a medium-sized needle, curved and flattened towards its point, and firmly grasped in a needle-holder, is thrust superficially into the sclera, tangentially to the upper edge of the

**Echo Méd. du Nord* and *La Clinique Ophtalmologique.* For abstract see THE OPHTHALMOSCOPE, May, 1908, p. 400.

cornea, so as to become fixed in the capsule of the eyeball. By means of a narrow Graefe knife, Bettremieux then excises a small shaving (*copeau*) of sclera, measuring about ½mm. in thickness, 1½mm. to 2mm. in width, and 2mm. to 3mm. in length. The scleral strip is then freed from conjunctiva at each end, and the last-named is brought together over the wound by a couple of fine catgut sutures.

The idea of the operation is that the thinned portion of sclera will favour elimination of the intra-ocular fluids, thereby answering to the definition of a filtering cicatrix as formulated by de Wecker. The attenuated part, which is marked by a greyish track, is termed by the author a "filtering zone" in order to distinguish it from a "filtering cicatrix." A localized protrusion has never been seen to follow the sclerectomy.

Simple anterior sclerectomy has been done by Bettremieux eight times on rabbits and ten times on the human subject. The pupil often dilates during its performance, a phenomenon which the author is inclined to ascribe to division of blood-vessels in communication with those which belong to the iris. The mydriasis is of brief duration, and is replaced by myosis twenty-four hours after the operation. Beyond the fact that in one rabbit the anterior chamber was opened accidentally, no complication has occurred.

As regards the results of the operation, Bettremieux gives particulars of a few cases. One was an instance of malignant glaucoma where the anterior chamber failed to re-form after sclerotomy. In this case simple anterior sclerectomy was followed, after seventeen days, by an attack of acute glaucoma, due, in Bettremieux's opinion, not to the operation but to the original nature of the affection. A case of simple chronic glaucoma, associated with extremely poor sight and retention of the outer part of the field only, recovered central vision and has kept it for more than five months after the operation of sclerectomy. Another similar case is mentioned. The author suggests that his operation, followed, after an interval, by iridectomy, might be useful in cases of acute glaucoma. So harmless a procedure, besides, might well be employed in the preventive treatment of glaucoma.

Finally, Bettremieux believes that his simple anterior sclerectomy is likely to be useful as a means of favouring the resorption of vitreous opacities, and he quotes a case in support of that opinion. SYDNEY STEPHENSON.

XII.—A NEW SYMPTOM-COMPLEX.

Stocké, Evariste.—A group of eye symptoms of thyroid origin. A propos d'un complexus symptomatique oculaire d'origine dysthyroïdienne.) *Bull. de la Société Belge d'Ophtalmologie*, No. 22, 1907, p. 46.

Stocké (Ghent) has observed five cases in which a particular grouping of eye symptoms appeared to be due to thyroid dystrophy. The series included three women and two men, whose ages ranged from 20 to 25 years. These patients presented the following symptoms in common: (1) pronounced redness of the ocular and palpebral conjunctiva; (2) a strikingly brilliant appearance of the corneæ; (3) slightly drooping upper eyelids; (4) red and prominent optic papillæ, together with dilated retinal arteries and veins, and a fundus oculi of dull-red hue; and (5) a puffed-up, red, and cyanotic face, with an appearance of bodily laziness and intellectual torpor. The patients, moreover, more especially the females, were obese, and affected with vasor-motor disturbances, as shown by coldness and cyanosis of the face, hands, and feet. Indigestion was invariably present in the shape of constipation and *hypochlorhydrie*. Subjectively, there were complaints of dryness, itching, and of intense heat of the eyelids and eyeball. Light was trying to the eyes, and temporal headache was common. The symptoms, ocular and general, are believed by Stocké to be due to an insufficiency of thyroid secretion. The local treatment was by the use of smoked glasses and of cold compresses to the forehead and eyes. Suitable diet and massage were adopted. The patient was also treated by the internal administration of Carlsbad salts, nux vomica, rhubarb, and potassium iodide. Thyroid was not given, since the other treatment sufficed to cure.

SYDNEY STEPHENSON.

XIII.—THE PAINTINGS OF COLOUR-BLIND ARTISTS.

Angelucci, A.—The paintings of Daltonians. (Les peintures des Daltoniens.) *Annali di Ottalmologia*, Vol. XXXVI, Fasc. 12, and *Recueil d'Ophtalmologie*, janvier, 1908.

Angelucci has a unique collection of pictures in that they are all by colour-blind painters whose vision he has examined himself. There are more colour-blind painters than one would imagine among Italian artists, for the reason that during their four years' study no examination of the students' colour-sense is ever made.

It appears that Liebreich was the first to draw attention to the peculiar and characteristic appearance of paintings by the colour

blind, as illustrated in a picture in the London Exhibition of 1871. The picture represented a cattle market. The roofs of the houses and the oxen were painted red on the bright side and green on the shaded side. This failing of rendering the lights red and the shades green, peculiar to certain colour-blind artists, has been designated Liebreich's sign by Angelucci. It is well shown in some of Angelucci's pictures. Others render subjects in a soft light dark-green and those in shadows dark-red, while the sky is painted intensely violet. Ludicrous effects are the rule in consequence—the sitters' faces, hair, and beards being rendered half red and half green, white linen reddish, feet red and green, nails green, etc.

The contrast between the complementary colours spoil in a great measure the good effect of drawing, design, and perspective.

It is interesting to note that the excessive use of violet—not uncommon with colour-blind artists—was at one time a craze among normal-sighted artists.

Other colour-blind artists paint the shaded parts of the face of a congested hue, while the lighted parts look pale and anæmic and add to the weird effect with a green beard and sky. Others, again, use dark-green in the soft lights, dark-red in the shadows and intense violet for the sky. Others make excessive use of magenta and substitute brown or grey for green.

Angelucci gives the following six signs as characteristic of colour-blind painters and their pictures :—(1) "Liebreich's sign" with its associated loss of perspective. In decorative art, green is sometimes employed for the shaded parts of flesh, to obtain a greater chromatic effect. The lighted parts may be rendered too red, but the result is not attained at the expense of perspective. (2) After prolonged practice, most Daltonians are able to distinguish red, so that the mistakes with that colour are less noticeable. This is not the case with green, which is freely used, especially in small paintings. (3) The abuse of violet is common to the absolutely colour-blind and those who are only red-green blind. The first use it largely in representing flesh, the second only in shadows. This error brightens up the colour scheme, and at one time became a much abused vogue among certain normal (Neapolitan) painters. (4) Exaggeration of the changes which green undergoes under different illumination, so that high lights become yellow and the shadows blue or bluish-green. (5) Excessive mixing of colours, so that a maroon coat is painted yellow in the lights, red in the shadows, and green in the half-lights. An ox is grey, red, and violet, a child's knickerbockers yellowish in the lights, blue in the half-lights, and violet in the shadows. (6) When the colour-blind, after much patience, diminish their colour defects and become expert in drawing and perspective, the pictures when confined to small objects, are so powerful in light and shade that the relief effects may equal that of the great masters.

Angelucci concludes that a colour-blind artist should confine himself to the use of white, black, yellow, and blue with which he should do excellent work, because he is strong in light and shade. He should also confine himself to nocturnes and snow scenes and avoid attempts at the reproduction of the varied colourings presented by Nature bathed in sunlight.

It is evident that if art students were all tested for colour-blindness at the beginning of their careers much valuable time would be saved and disappointment averted by those whose colour-sense is defective. J. Jameson Evans.

XIV.—EXTIRPATION OF THE SUPERIOR CERVICAL GANGLION OF THE SYMPATHETIC NERVE.

Gasparrini, E.—Alterations following extirpation of the superior cervical ganglion of the sympathetic: second contribution. *Annali di Ottalmologia*, Vol. XXXV (1906), fasc. 7 to 9, p. 686 to 713.

From his experiments, over 100 in number, on rabbits, cats, dogs, and monkeys, **Gasparrini** concludes that extirpation of the superior cervical sympathetic ganglion of one side is followed by degenerative phenomena of the optic nerve, ciliary ganglion, retina, and ciliary nerves of both sides. On the non-operated side these alterations are less marked, for they appear only after lesions, so to speak sympathetic, which have become established in the superior cervical ganglion which remains. In the same period serious alterations in the blood-elements, and dystrophies which end in the death of the animal become manifest. The animal dies after nine months at most. In dogs, especially, unilateral sympathectomy ends by practically becoming a bilateral sympathectomy, which, as we know, these animals never survive. The increase of refraction on the operated side (Angelucci) and the increase in density of the aqueous by albumins (Lodato) have not been confirmed by Gasparrini, who investigated this point with special care. The alterations in the blood occur almost at the same time as the lesions of the intact cervical ganglion, commence from about the fifteenth day after the sympathectomy, and progress with greater or less rapidity according to the length of time the animal survives. Anæmia of mucous membranes is already manifest at the end of one month, very marked in three months, and extreme at the last period of the cachexia (red cells reduced to two millions, instead of eight or nine in the dog; complete absence of basophile granules, etc.) This anæmia is seen also on ophthalmoscopic examination (disc very pale, central vessels reduced in size, etc.)

The dryness of the mucous membranes, emaciation, softness of muscles, cutaneous dystrophy (alopecia, bed sores), and general weakness in spite of preservation of appetite, terminate the cachexia. The causes of error, especially the influence of first operative infection, unhealthy surroundings of the animal, wounding of the ganglion of the tenth pair during operation, have been carefully excluded by Gasparrini. His histological investigations on the alterations in the sympathetic and ciliary ganglia and the tissues of the eyeball deserve to be read in the original. The cause of the lesions of the intact ganglion and the course which these lesions follow along the operated side and towards the other side demand further research.

A. ANTONELLI.

XV.—THE EYES OF EPILEPTICS BETWEEN THE ATTACKS.

Rodiet, Pansier, and Cans.—The eyes of epileptics between the attacks. (**Les yeux des epileptiques en dehors des accès.**) *Recueil d'Ophtalmologie*, mars et avril, 1908.

This paper gives a critical review of the work done by various observers on the ocular manifestations in epileptics during the intervals between the attacks, and a detailed account of thirteen cases which have been observed by the authors.

The paper does not lend itself to abstraction, as it involves the discussion of—

I. Pupillary disturbances :—
   - (a) The relative frequency of mydriases, myosis, and ordinary-sized pupils.
   - (b) Hippus.
   - (c) Sign of Piltz.
   - (d) Inequality of the pupils.
   - (e) Eccentricity.
   - (f) Chromatic asymmetry.
   - (g) Thickening, loss of brilliancy, and pigmentary disturbances of the iris.
   - (h) Pupillary reflexes.
   - (i) Effect of treatment by bromide of potassium.

II. Sensory disturbances of the eye and neighbouring parts.

III. Visual disturbances :—
   - (a) Central and peripheral fields.
   - (b) Hemianopia.
   - (c) Colour-vision.
   - (d) Scotomata.
   - (e) Erythropsia, micropsia, macropsia, oxyopsia, hemeralopia, and other visual aberrations and illusions.

Of the thirteen cases (selected out of 50) observed by the authors, eleven were women. In all cases a slight mydriasis was noted during the period of depression following an epileptic seizure. The pupillary reflexes were present, but were often perverted (paradoxical hippus). For some time after the attacks conjunctival congestion, hyperæsthesia, or anæsthesia were also noted. Retinal hyperæmia is always present during the stage of clonic convulsions, and lasts from 1-12 hours or more, according to the severity of the attacks. The authors regard this retinal congestion as characteristic—the papilla and retina are pale, and the veins, especially in the lower part of the retina, are dilated and tortuous. Hæmorrhages, which were occasionally observed on the disc, indicated that the condition is one of passive venous congestion.

The permanent disturbances observed in the fundus included:—

1. Marked pallor of papilla and retina—probably anæmic.
2. In cases of frequently recurring attacks of about 20 years' duration, especially in adults of 25-30 years of age, optic neuritis or advanced grey atrophy.
3. Very often a permanent passive venous congestion of the fundus with a pale disc. This was suggestive of a subatrophy of the disc and retina rather than of anæmia.
4. In several cases intense blackish pigmentation of the retina and choroid, suggestive of a syphilitic origin.
5. Irregular contraction of the visual field with peripheral notching not assuming the form of hemianopia.

As compared with the condition before the attack, the contraction of the field was very noticeable after the attack.

Other visual troubles noted were mental rather than ocular in nature. J. Jameson Evans.

XVI.—GLAUCOMA.

(1) Dianoux.—Glaucoma and sclerotomy. (Glaucome et sclérotomie.) *Annales d' Oculistique*, T. CXXXIII, p. 81, février, 1905.

(2) Abadie.—Glaucoma and sclerotomy: Reply to Dr. Dianoux. (Glaucome et sclerotomie—Réponse au Dr. Dianoux.) *Annales d'Oculistique*, T. CXXXIII, p. 202, mars, 1905.

(3) Cirincione, Junior.—Primary glaucoma due to occlusion of the pupil caused by the lens—Contra-indication of myotics in such cases. (Glaucoma primario per occlusione del forame pupillare fotta dal cristallino—Azionidannosa dei miotici.) *La Clinica Oculistica*, Marzo, 1905.

(4) Fernandez, J. S.—Glaucoma with contracted pupil. (La contraccion de la pupila en la glaucoma.) *Archivos de Oftalmologia Hispano-Americanos*, Junio, 1905.

(5) Raehlmann, E. — Secondary glaucoma and traumatic cataract. (Ueber Secundärglaukom und traumatische Katarakt.) *Ophthal. Klinik*, Juli, 1906.

(6) Hepburn, Malcolm L.—Retina in glaucoma cup. *Royal London Ophthalmic Hospital Reports*, Vol. 16, Part 4.

(7) Frugiuele, C.—Acute glaucoma and dacryocystitis. *Giornale internazionale delle Scienze Mediche*, February, 1907, pp. 170.

(8) Carlini.—On glaucoma secondary to dislocation of the crystalline lens ; an anatomo-pathological contribution. *Annali di Ottalmologia*, Vol. XXXVI (1907), fasc. 2 to 11, with one plate of micro-photographs.

(9) Dufour, M.—On transient increase in the intra-ocular pressure. (Ueber vorübergehende Drucksteigerung.) *Die Ophthalm. Klinik*, Juli 5, 1907, and *La Clinique Ophtalmologique*, juillet, 1907, and *Bull. et Mém. de la Société Française d'Ophtalmologie*, T. XXIV, 1907, p. 240.

(10) Erdmann, Paul.—Upon experimental glaucoma, with investigations on the glaucomatous eye in animals. (Ueber experimentelles Glaucom nebst Untersuchungen am glaukomatösen Thierauge.) I. par: *Archiv f. Ophthalmologie.* Bd. 66, 2, 16 Juli, 1907. Part II.: *Ibidem.* Bd. 66, 3, 17 September, 1907.

(11) Angéli, Philippi. — Emotional glaucoma. (Glaucome émotif.) *La Clinique Ophtalmologique*, 10 octobre, 1907.

(12) Schmidt-Rimpler, H.—High tension cupping and optic atrophy. (Druck-Excavation und Sehnerven-Atrophie.) *Arch. f. Augenheilk.*, Dezember, 1907, p. 1. Illustrated.

(13) Hesse, Robert.—Glaucoma and detachment of the retina. (Glaukom und Netzhautablösung.) *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1907.

(14) Hesse, Robert. —On the cause of high tension in partial staphyloma of the cornea. (Ueber die Ursache der Drucksteigerung bei Partial-Staphylom der Hornhaut.) *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1907.

(15) Kuschel, J. — Simple chronic glaucoma, the first onward step from the glaucomatous disposition. (Der Glaucoma chronicum simplex als der nähst höhere Steigerungs grad der glaucomatösen Disposition.) *Zeitschrift f. Augenheilkunde*, Mai, 1908.

(16) **Hegner, C. A.—Malignant glaucoma after iridectomy; recovery after posterior sclerotomies; observation of the case for ten years. (Glaucoma malignum nach iridektomie; Wiederherstellung durch hintere Sklerotomien mit zehnjahriger Beobach-tungszeit.)** *Zeitschrift f. Augenheilkunde*, June, 1908.

(1) **Dianoux**, so far from agreeing with the opinions recently expressed by Abadie that sclerotomy is useless in glaucoma, has given up iridectomy in its favour in both acute and chronic cases. As both these surgeons perform sclerotomy according to the method of de Wecker, Dianoux concludes that the superiority which he claims for his results must depend on his after-treatment. This is directed to the production of a filtration scar and consists in massage twice daily, commenced twelve hours after the operation by the surgeon and continued by the patient, after his discharge, for the rest of his life. In addition, drops containing eserin and pilocarpin, with or without cocain and adrenalin, according to circumstances, are ordered twice daily. For the treatment of simple chronic glaucoma, Dianoux recommends the following routine: note carefully the field for white and for colours, the light-sense, the visual acuity, and the accommodation; explain to the patient the nature of the disease and the mode of action of the treatment prescribed; teach him to massage his eye, and direct him to do so twice daily, and at the same time to use drops containing myotics; repeat the examination every month, and if ground is lost, do sclerotomy, followed by the treatment already described, and at the same time give internally small doses of quinine and iodide of soda, alternating with small doses of tincture of strophanthus. R. J. COULTER.

(2) **Abadie** replies to Dianoux's criticism of his opinion as to the inefficacy of sclerotomy in the treatment of glaucoma; that Dianoux, by admitting the necessity of after-treatment by massage and myotics, corroborates his (Abadie's) original statement that sclerotomy alone by itself does not give lasting results. He protests against the abandonment of iridectomy in acute cases, in which it has given many brilliant and permanent results without the aid of any other treatment. R. J. COULTER.

(3) **Cirincione** brings forward a clinical case to corroborate the theory of glaucoma enunciated years ago by Manfredi, of Pisa, *viz.*, that secondary glaucoma could be produced by the mechanical occlusion of the pupil due to forward dislocation of the lens. This theory has already been proved experimentally by Rowboloth. But the clinical case (chosen from many others) brought forward by the author, is one of primary glaucoma, in which the displacement of the lens towards the edge of the pupil, probably through œdema and consequent increase of volume of the vitreous, was such as to cause complete obliteration of the anterior chamber and a suppression of the intra-ocular circulation through the pupillary opening.

With the above *data* it is easily understood that the use of myotics would be exceedingly detrimental in these cases of glaucoma, as, by contracting the pupil, the passage of lymph from the posterior to the anterior chamber is rendered still more difficult, and hence also the excretion of the same from the eye, which would consequently increase the tension with all the train of symptoms depending thereupon. CHARLES MANCHÉ.

(4) Dilatation of the pupil is usually considered a sign of primary importance in the diagnosis of glaucoma. Occasionally, there may be found patients in whom the pupil is contracted, although the eye may be in full evolution of glaucoma, as shown by pain and increase of intra-ocular tension.

HAROLD GRIMSDALE.

(5) **Raehlmann** contributes an interesting paper upon the causation of secondary glaucoma. He observes, that the normal aqueous humour is almost free from albumen, but as soon as the anterior chamber is tapped albumen makes its appearance in greater quantity. This albumen is not visible to the naked eye, the aqueous humour remains clear, but if examined by the ultra-microscope, it is seen to be present in the form of small particles oscillating round each other. If a ferment or some precipitating agent is added, the particles coalesce to form larger ones. In commencing inflammation of the anterior portion of the eye-ball, the anterior chamber is flooded with albumen which is precipitated upon the cornea, causing the appearance which is known as punctate keratitis. This is what takes place in all cases of so-called serous iritis. And not only is the albumen deposited upon the posterior surface of the cornea, but also upon the numerous corners and ridges in the spaces of Fontana, where it forms a mechanical obstruction to the outflow of the aqueous humour. Similarly, in cases where the capsule of the lens has been ruptured, the anterior chamber is flooded with albumen. It is precipitated and deposited as above, and so again leads to obstruction by narrowing the lumen of the spaces. If a small quantity of the aqueous humour is removed with a syringe and examined with the ultra-microscope, and then diluted with distilled water, it is noticed that more and more particles of albumen become visible. On the other hand, if some sodium chloride be added, some of the particles will dissolve, the amount of albumen held in solution depending upon the quantity of sodium chloride present. This explains how a large rupture in the lens capsule may be followed by a rise in tension, while a small one will not. It also suggests a line of treatment by injections of salt solution into the anterior chamber.

PERCIVAL J. HAY.

(6) It is extremely rare to find retinal elements in a glaucoma cup, but when they are there the question arises as to how it is possible for them to get there. **Hepburn** has examined a number of cases in which fibrous tissue is found in the cup at

the nerve-head. By far the greater number of cases in which this is found, are cases of secondary glaucoma, following irido-cyclitis. According to the longer duration of the inflammation, so we find greater changes, and it is not uncommon for fibrous tissue to be developed in close proximity to the retinal blood vessels. Sooner or later tension comes on, and the nerve head becomes pushed back. The fibrous tissue already present may be attached to the retina and so be dragged back with it. In the majority of cases the retina does not hold, and we may get just a strand left connecting the two, or it may separate altogether. Some excellent photographs accompany the paper, which, from the pathological point of view, is interesting. C. D. M.

(7) **Frugiuele** practices subconjunctival iridectomy where iridectomy becomes necessary in cases in which there is risk of infection. A conjunctival buttonhole, 10 mm. in length, is made one centimetre from the cornea and concentric therewith. The pocket is dissected up to the cornea, the incision is made by sliding the lance knife into the pocket, an assistant holds the pocket forward with hooks, and the iris is excised. The conjunctival wound is stitched. A. ANTONELLI.

(8) The conclusion come to by **Carlini**, after clinical and anatomico-pathological statement of his case, is that for certain glaucomas secondary to dislocation of the lens a mixed or complex pathogenesis must be admitted. The irido-corneal adhesion, or at least lesions of the iridic angle which hinder excretion, form nevertheless the indispensable element, if not the first in order of time, in the establishment of glaucomatous hypertension. A. ANTONELLI.

(9) **Dufour** discusses the question of diurnal changes in the intra-ocular pressure, and maintains that a comparatively slight increase in pressure beyond the physiological limits may give rise to the following symptoms :—haziness of vision and a feeling of stiffness about the eyes on waking up in the morning ; the lids feel heavy and dry and can scarcely be moved over the eyes ; lacrymal secretion is wanting. These symptoms disappear in the course of an hour or so. The author attributes them to an increase in the volume of the eye, which puts the lids upon the stretch and hinders the movements of the eye. The rise in pressure he believes is due to dilatation of the pupil during sleep, and passive congestion brought about by rest and by pressure upon the vessels of the neck. To prevent this condition, the writer recommends sleeping with the light burning, and pilocarpin drops before going to bed. PERCIVAL J. HAY.

(10) **Erdmann** was able to produce glaucoma in the rabbit's eye by introducing into the anterior chamber a thin steel needle, which formed the positive electrode of a current of 5 MA. The source of glaucoma was an obliteration of the angle of filtration by proliferation of the endothelium caused by minute granules of the oxide of steel. In further experiments he found it easier

first to collect the electrolytic products of iron from the chamber water, and to introduce them afterwards into the anterior chamber, so as to minimise the reaction. He could thus produce glaucoma in 75 per cent. of his cases. The resulting glaucoma was of the infantile human form, especially in so far as it led to enlargement of the eyeball, flattening of the cornea, and ruptures in Descemet's membrane. The more or less marked excavation of the optic nerve was certainly a product of increased pressure. It is interesting to record that in his experimental cases of glaucoma myotics caused a diminution, and mydriatics a marked increase of intraocular pressure; that fluorescein, if introduced into the blood circulation, appeared sooner and more abundantly in the chamber water than under conditions of health; also that the chamber water was richer in albumen and that the author could not ascertain the presence of any hæmolysin (Roemer) in it.

R. GRUBER.

(11) Under the title of emotional glaucoma **Angèli** relates the case of a girl of 25 years, who for three years had suffered from more or less severe attacks of acute glaucoma following any little emotion, such as a quarrel with her mother or with her employer. The attacks usually quickly subsided, and after the subsidence of the one which is here described the fields of vision and the fundi were found to be normal. The refraction was hypermetropic, with astigmatism against the rule in one eye and with the rule in the other. Beyond having a nervous temperament, the patient presented no sign of any particular diathesis. Menstruation was regular. Treatment consisted in myotics and bromide of potassium. The author assumes that she remained well at the end of a month because he had not seen her, a conclusion which in this country would seem a trifle lame.

ERNEST THOMSON.

(12) **Schmidt-Rimpler's** paper deals with those rare cases of deep cupping of the disc due to optic atrophy, but simulating the glaucomatous condition. Cases are related of deep atrophic cupping of the disc following optic neuritis, of displacement of the lamina cribrosa from simple optic atrophy, and of optic atrophy complicated with simple or inflammatory glaucoma.

PERCIVAL J. HAY.

(13) **Hesse** observed the co-existence of glaucoma and detached retina in the following case: a man, aged 36, exhibited, when first seen, a nearly mature swelling cataract with a shallow anterior chamber, but normal tension. The projection was faulty. One and a half months later the signs and symptoms of acute glaucoma in the same eye roused the suspicion of tumour, and although it was not confirmed by the results of trans-illumination, the eye was enucleated. A nearly complete detachment of the retina was found, but no tumour. The microscopical examination showed the root of the iris pushed right into the angle of the anterior chamber, thus obliterating

the paths of filtration. The course of events seems to have been the following: an eye, with a naturally shallow anterior chamber, suffered detachment of the retina and secondary cataract; the swelling of the lens caused the anterior chamber to become shallower still—obliterated it in its most peripheral parts and gave rise to secondary glaucoma. C. MARKUS.

(14) **Hesse** inquired into the circumstances that account for increased ocular tension in cases of cicatrized prolapse of the iris with or without staphylomatous bulging of the cornea. In such cases the iris and anterior chamber, apart from the region of the prolapse, may appear perfectly normal clinically. Yet the anatomical examination of the two globes in which these conditions obtained, showed that the root of the iris was glued to the sclero-corneal margin all round and thus completely obliterated the angle of filtration. This anatomical finding explains the frequent occurrence of glaucoma secondary to an iris-prolapse of comparatively small extent. The practical conclusion to be drawn is to do a prophylactic iridectomy in these cases as early as possible, before the exudation from the periphery of the iris has become organized into solid connective tissue, which definitely binds the root of the iris to the region of Schlemm's canal. C. MARKUS.

(15) **Kuschel** (Ludenscheid) adds yet another of his tedious papers to the seven or eight which have already appeared on the same subject. The present contribution, which deals chiefly with excavation of the optic nerve, is but a further elaboration of an almost interminable article on the architecture of the eye. If the author would concentrate his ideas into one short and lucid paper they would be easier to grasp. As things are, we can only regret that life is short, and hope that the series is now complete; but, alas! we cannot hope to escape "Acute glaucoma, the last step ——." T. HARRISON BUTLER.

(16) In **Hegner's** case dormant glaucoma became active during an attack of influenza. After iridectomy, the globe remained hard, and the anterior chamber did not refill. Vision sank to hand-reflex. After two meridional posterior sclerotomies, the tension fell and the anterior chamber re-formed. The effect was, however, ephemeral; as the sclerotomy wounds healed, tension rose again and vision rapidly fell; but the anterior chamber did not disapper, a cystoid cicatrix formed in the scleral portion of the iridectomy wound, and with the help of myotics this served to keep the tension down. Vision rose to 2/7, and eight months later it was found to be the same. Ten years later the condition was unaltered, although no treatment had been carried out in the interval. Hegner thinks that the posterior sclerotomies conduced to this good result by enabling the anterior chamber to re-form, and permitting the development of a cystoid cicatrix. T. HARRISON BUTLER.

XVII.—XERODERMA PIGMENTOSUM.

(1) **Velhagen, C.—A contribution to the knowledge of Xeroderma Pigmentosum.** *Arch. f. Augenheilkunde*, Bd. LXVI, No. 3, and *Archives of Ophthalmology*, March, 1908.

(2) **Pergens, Ed.—The ocular complications of Xeroderma Pigmentosum.** *Bull. de la Société Belge d'Ophtalmologie*, No. 24, 1908.

Xeroderma pigmentosum (Kaposi's disease) is a rare family affection of the skin, of which the cause is altogether obscure. Its onset is usually in early life at a time when the child is freely exposed to light and to air. It is characterised by dryness and freckling of the exposed parts of the integument (as the face and hands), localised atrophic areas, dilatations of the capillary vessels, and, finally, by the development of warty growths, which are apt to take on malignant features and to lead to a fatal result. Eye changes, as in the cases to be abstracted immediately, are not uncommon in xeroderma pigmentosum.

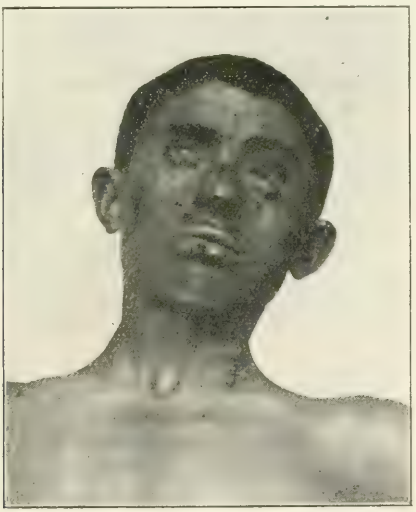


FIG. 1.

Pergens (Maesyck) met with four instances of the disease in members of one family, and in three of the patients the eyes were involved. One patient, a man of 19 years, presented a carcinomatous tumour which occupied the middle-third of the left lower eyelid and which involved the cornea (*see* figure 1). The other eye showed merely a pronounced vascularity of the ocular conjunctiva in the palpebral fissure. The sister of the last patient, a girl

aged 9 years, and the brother, aged 7 years, were affected with similar conjunctival changes. The eyes of the fourth patient, a boy aged 13 years, were not affected by the disease. There was some distant consanguinity between the parents of the four children. No family history of xeroderma pigmentosum.

Velhagen (Chemnitz) has an elaborate communication on xeroderma pigmentosum, of which he reports four instances, namely, two in sisters and two in first cousins (females) of the latter. The families were of the Hebrew race, but there was no blood-relationship between them. The appearances in the first pair of sisters are shown in the accompanying figures (2 and 3).

FIG. 2.

All the patients manifested changes as regards the eyes. These included partial loss of cilia, neoplastic formations in the skin of the eyelids, atrophic shrinkage of the palpebræ with consecutive anomalies of position, as entropion and ectropion, and corneal ulcerations and opacities. All the cases showed, besides, shrinkage of the conjunctiva, the result, doubtless, of a localised xeroderma. A peculiar cicatricial formation (not described heretofore) was present in the region between the caruncle and the inner edge of the cornea, and Velhagen is inclined to think that this sign, which appeared early in the course of the disease, may be of some importance in the differential diagnosis. In one of the patients an epibulbar tumour, the size of a small bean, lay on either side of the cornea and was covered by non-adherent conjunctiva. The tumours were not movable on the underlying

sclera. Similar growths have been noted in xeroderma pigmentosum by Lukasiewitsch and Greeff respectively.

FIG. 3.

Histological examination of Velhagen's specimens rendered it evident that they did not represent an epithelial proliferation of conjunctival origin, neither did they resemble endotheliomata originating from scleral tissue or Tenon's capsule. The author surmises that a nævus, or some other aberrant rudiment, was the starting-point of the growths. SYDNEY STEPHENSON.

XVIII.—MYOPIA.

(1) **Parisotti.—Traumatic myopia. (Miopia traumatica.)** *Riv. Ital. di Ottal.*, September, 1905.

(2) **Pause, G.—A contribution to the study of myopia. (Beitrag zur Lehre von der Kurzsichtigkeit.)** *Zeitschrift f. Augenheilkunde*, Mai, 1906.

(3) **Ask, F.— Anthropometrical studies on the size and form of the anterior opening of the orbit in Swedes and their relationship to myopia.** *Zeitschrift f. Augenheilkunde*, Juli und August, 1906.

(4) **Schieck, F.—On transitory myopia. (Ueber temporäre Myopie.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1907.

(5) **Pyle, Walter L.—Myopia associated with opacities of the cornea.** *Journal American Medical Association*, July 20, 1907.

(6 **Schulin, C.—The true cause of myopia.** (**Die wahre Ursache der Myopie.**) *Woch. f. Ther. und Hygiene des Auges*, Januar 9 und 16, 1908.

(7) **Ask, F.—Further remarks on the myopia question.** (**Noch einige Bemerkungen zur Myopiafrage.**) *Zeitschrift f. Augenheilkunde*, März, 1908.

(8) **Stock, W.—On cavernous atrophy of the optic nerve in myopia.** (**Ueber Kavernöse Sehnerven-Atrophie bei Myopie.**) *Klin. Monatsbl. f. Augenheilkunde*, April, 1908.

(9) **Alvarez.—The correction of myopia.** (**Correccion de la Miopia.**) *Arch. de Oftal. Hisp.-Americanos*, Mayo, 1908.

(1) In this paper **Parisotti** (Rome) gives an account of a case in which traumatic myopia was diagnosed by a surgeon, and Parisotti was called in as an expert to attest the damages.

In the next case, also, as in the preceding case of traumatic amblyopia, the patient had been hurled to the ground, and had struck his forehead, but here there was no wound. Examination of the eye showed signs that it had possessed myopia for a long time; apart from a large crescent, there were several isolated patches of choroidal atrophy, such as are frequently met with in myopia. The amount of myopia found, —11.0 D. in each eye, could not be caused by dislocation of the lens, or rupture of the suspensory ligament. There was a considerable element of fraud in this case, also, although the malingerer was not exceptionally adept, and contradicted himself in various ways. There was little doubt that the imposture was dictated by the desire to obtain damages. HAROLD GRIMSDALE.

(2) **Pause** discusses Stilling's theory of the causation of myopia, namely, that it is due to muscle-pressure on the growing globe by all the muscles, but more especially by the superior oblique. On purely theoretical grounds, the conclusion is arrived at that this theory is insufficient, and Pause's own view is summed up as follows:—1. The accommodation, convergence, and muscle theories do not give us a sufficient explanation of the causation of myopia; 2. Myopia in all its forms is to be considered as a disease; 3. Only well-developed persons will have well-developed eyes equal to the work imposed on them; in the poorly-developed ones, the eyes will tend to fail; 4. Being an illness, it can be arrested when the whole organism becomes healthy. A. LEVY.

(3) **Ask** refers to Stilling's theory that myopia occurs especially in people with low orbits, and has investigated this question in Sweden. Measurements have been taken of large

numbers of people in higher classes of the schools and in the universities, and he comes to the conclusion that such a relationship does exist, the average height of the orbit in the myope being distinctly less than it is in the emmetrope or hypermetrope. A. LEVY.

(4) **Schieck's** paper centres round the case of a smith, aged 27, who, really emmetropic, exhibited for more than a week a myopia of 4D. The only circumstance that could be held responsible for this unusual occurrence was profuse diarrhœa, from which the patient had suffered during ten days. The analogy of diabetes offers a possible explanation, as here, too, a pathological loss of fluid may be accompanied by myopia, which is probably due to an increase in the curvature of the lens. But Schieck recalls also Moauro's observations of transitory myopia in jaundice, where the causal mechanism is even less understood than in diabetes. C. MARKUS.

(5) In regard to this condition, **Pyle** (Philadelphia) has reached the following conclusions:—

1. Central corneal opacities are a much more frequent cause of myopia than would be inferred from an examination of general ophthalmic literature, particularly the English and American text-books and periodicals. According to recent reliable continental statistics, in at least one-third of the cases in which they are present, central corneal opacities produce myopia, although this average is slightly higher than that which is found in American ophthalmic practice.

2. The myopia is axial and not dependent on alteration of the corneal curve. Ophthalmometric examinations do not show any significant differences between the corneal curvature of myopic eyes with corneal opacities, and similar eyes in which the refraction is emmetropic or hyperopic.

3. The mechanism of the production of the myopia is analogous to that of the common form following astigmatism, anisometropia, etc., with the added predisposing factor of weakened ocular tunics by previous inflammation.

4. The association of disturbances of the choroid and retina of the posterior segment of the eyeball with inflammations of the anterior membrane is an important element in further reducing visual acuity in these cases. For a similar reason extensive fundus lesions are common, and the myopia is more likely to become progressive than ordinary.

5. Unilateral opacities may produce myopia, and the myopia produced may be unilateral or bilateral.

6. In the cases of unilateral opacity the myopia may be single or double. If in such cases the myopia is unilateral, it may appear either on the sound or the affected side, but no definite rule can be established in this connection. However, it is likely that when one eye is used almost exclusively for close vision, it will become myopic first or to a greater extent than its fellow.

7. In cases of bilateral corneal opacities, the myopia is generally bilateral. When there is a marked difference in the amount of defect in the two eyes, the greatest myopia is often found in the eye with the least corrected visual acuity. When the myopia is unilateral, it often occurs in the eye with the least opacity.

8. The cases of unilateral myopia are strongly suggestive of the importance of ciliary strain rather than excessive convergence in myopogenesis.

9. In view of the strong possibility of resultant myopia, all cases of corneal disease, particularly the phlyctenular affections of childhood, should receive prompt and continuous treatment, and prophylactic measures should be rigidly followed to prevent recurrences. After the subsidence of the inflammation energetic treatment should be adopted to clear up the opacities.

10. Of greatest importance in the prevention of the subsequent myopia is careful and repeated refraction of both eyes under artificial cycloplegia, employing both objective and subjective methods, and the constant use of correcting lenses.

11. All errors in ocular, personal, and domestic hygiene that encourage the development of myopia should be corrected, and the patient should be kept in the best physical condition and most salutary environment. C. A. OLIVER.

(6) **Schulin** in the first section of his paper gives a rapid review of the modern teachings on the refraction of the eye, and, in particular, of myopia. He declares that the brightly-illuminated and carefully-furnished schoolrooms of the present day have not prevented the development of myopia, and throws aside the views which place the cause of myopia in poorly-lit rooms at home or hypermetropic astigmatism. From the records of the examination of over 5,000 individuals, Schulin advances the proposition that Donders' normal $\frac{20}{20}$ is too low According to him, healthy persons have a refraction of + 1.00 and vision $\frac{20}{15}$, while 4 per cent. of the inhabitants of Montana have V. $\frac{20}{10}$. Arguing from an analogy with asthenopia and presbyopia, Schulin holds that myopia, like the other two, depends upon an abnormal state of the general health.

The second portion of the paper is given up at first to the physiology of the ciliary muscle. The muscle-tone, and with it the length of the muscle-fibres, varies continually in health and disease. The refraction therefore varies with the state of the health and with the blood-pressure. It is most constant in presbyopia, especially with myopia, since there is atrophy of the ciliary muscle and a certain degree of rigidity of the eyeball. A constant spasmodic contraction or cramp of the muscle is impossible. All muscles produce an internal secretion, and here the author brings the subject into relation with Poehl and Tarchanoff's work on spermin ("*Rationellen Organotherapie*"), according to which spermin is of the nature of a ferment, in the

presence of which occurs the oxidation of the products of regressive metamorphosis. So long as the processes of assimilation and the production of spermin are in order, there is health, as shown by the power and tone of the muscles.

There are fourteen muscles connected with the eyes, *viz.*, the six external and the ciliary to each eye. Their co-ordination is of the most accurate character. Every movement requires a certain contraction of each of the fourteen muscles. During sleep, the muscles are not completely relaxed. The muscle-tone continues, and if the sleep be disturbed by dreams, movements may be made, or single muscles may even pass into a condition of katatonic rigidity. This is specially true of the muscles of the eyes, which are rarely parallel during sleep, but, as the result of katatonic spasm of certain muscles, are turned upwards and inwards with convergent axes. In the disturbed sleep of an indisposed or ailing child, the eyes may become fixed on some bright object in an incompletely darkened room, or if it is visible only to one eye, the eyes may be set in contradictory positions. This nightly repetition of the pressure of the spasmodically contracted muscles and tendons upon a weak sclerotic may produce changes in the shape of the eyeball, leading to myopia. The author points out that the years of childhood noted for the onset of myopia are also characterised by the tendency to scrofula; and supported by a few cases, he affirms that the true cause of myopia lies in the badly-darkened rooms in which weak and strumous children pass the night in disturbed sleep.

While it is probable that myopes have not the vigorous and robust health of other children, and in accordance with their more studious habits, spend less time in the open air, it does not seem true that they are all scrofulous, nor does it appear to the reviewer that myopia is more frequent among strumous children, large numbers of whom frequent our eye clinics, except when owing to corneal nebulæ, they have been forced into the habit of keeping their near-work as close to the eyes as possible. W. B. Inglis Pollock.

(7) **Ask's** paper is a polemic between the author and Hamburger who appear to differ in their explanation of the fact that myopia in Sweden has diminished in frequency in the last 10 to 20 years to the extent of 20 per cent. Neither Hamburger nor Ask appears to offer any adequate solution of the problem.

T. Harrison Butler.

(8). A type of optic atrophy considered to be characteristic of glaucoma (Schnabel) had been observed once before in a case of excessive myopia (see abstract of Pollatti's paper in The Ophthalmoscope, 1906, p. 638). **Stock**, in continuation of these researches, examined microscopically a series of highly myopic eyes and met with the same condition in five instances. He therefore concludes that the occurrence of cavities in the

optic nerve is common to both glaucoma and high myopia. By way of explaining this remarkable type of atrophy, he considers that the cavities are caused by the tearing of nerve-fibres as a result of increased intra-ocular pressure in glaucoma and of distention of the globe in myopia. C. MARKUS.

(9) **Alvarez** thinks that the best results are obtained by total correction of myopia in children of school-age; where such correction is not possible, total correction in later years is rarely so successful. It is usually necessary to decentre the lenses, to restore the relation between accommodation and convergence. HAROLD GRIMSDALE.

XIX.—REMEDIES.

(1) **Bailliart. — Subconjunctival injections.** (Technique et indications des injections sous-conjonctivales.) *Bull. Gén. de Thérapeutique*, 23 septembre, 1907.

(2) **Roselli, R.—The action of radium upon the tissues of the eye.** *Annali di Ottalmologia*, Vol. XXXVI, 1907, Fasc 12.

(3) **Widmark, J.—Upon the treatment of sympathetic inflammation of the eye by sodium salicylate.** (Ueber die Behandlung der sympathischen Augenentzündung mit Natron salicylicum.) *Mitteilungen aus der Augenklinik des Carolinischen Medico - Chirurgischen Instituts zu Stockholm.* Neuntes Heft. Verlag von Gustav Fischer in Jena. 1908.

(4) **Martin, H. H.—The treatment of interstitial keratitis.** *Journal American Medical Association*, April 11, 1908.

(5) **Salmon, Paul.—Arsenic in syphilis.** (L'Arsenic dans la syphilis.) *La Clinique Ophtalmologique*, avril 25, 1908.

(6) **Reber, Wendell.—Comparative potency of hyoscin and scopolamin and hydrobromin in refraction work.** *Journal American Medical Association*, April 25, 1908.

(7) **Gonzalez.—Electricity as an agent for reducing the intraocular tension.** (La electricidad como agente hipotonizante en Oftalmologia.) *Anales de Oftalmologia*, Abril, 1908.

(8) **Connor, Leartus.—Remarks on vibratory massage in in eye diseases.** *Ophthalmology*, April and July, 1908.

(9) **Terson, A.—Treatment of wounds of the eye.** (Traitement des plaies de l'œil.) *La Clinique Ophtalmologique*, 10 mai, 1908.

(10) **Hawley.**—Dionin in the treatment of old opacities of the cornea. (La dionina en las opacidades antiguas de la cornea.) *Anales de Oftalmologia*, Mayo, 1908.

(11) **Evans, J. Jameson.**—Tuberculin in the diagnosis and treatment of diseases of the eye. *Birmingham Medical Review*, June, 1908.

(12) **Alger, Ellice M.**—To what extent is migraine amenable to treatment of the eyes? *New York Medical Journal*, June 6, 1908.

(13) **Fox, L. Webster.** — The value of morphine derivatives in ocular therapeutics. *New England Medical Monthly*, June, 1908, and *Ophthalmic Record*, August, 1908, and *Therapist*, August 15th, 1908.

(14) **Leprince, A.** — Treatment of facial neuralgia by radiotherapy. (Traitement de la névralgie faciale par la radiothérapie.) *Rev. d'Hygiène et de Thérapeutique Oculaires*, juillet, 1908.

(15) **Langheld.**—Diagnosis, therapy, and the result from treatment of constitutional disease of the eye through oxidation. *Therapist*, July 15, 1908.

(16) **Brav, Aaron.**—The rational treatment of blepharitis. *Therapeutic Gazette*, August 15th, 1908.

(17) **Yvert, A.**—The dangers of employing simultaneously compounds containing iodine and mercury. (Incompatibilités médicamenteuses ; dangers de l'emploi simultané des composés iodiques et des sels de mercure.) *Recueil d'Ophtalmologie*, août, 1908.

(1) **Bailliart** describes the *technique* of subconjunctival injections, and the indications for their employment, without, however, adding anything to what is already known upon these subjects. SYDNEY STEPHENSON.

(2) According to three sets of experiments made by **Roselli** (Rome) upon rabbits, radium, one milligramme, placed at a distance of 3 mm. or 4 mm. from the eye for half an hour, for one, two, or three consecutive days, exercises no action whatever, neither macroscopic nor histological, upon the different parts of the apparatus of sight. In future, the author will experiment with larger quantities of radium. A. ANTONELLI.

(3) **Widmark** (Stockholm) reports on five cases of sympathetic ophthalmitis in which treatment with sodium salicylate, instead of the usual mercury, was adopted, and recapitulates Lindahl's results with the same treatment in seven other cases, published in 1904. The cases may be summarized briefly as follows :—

Widmark's Cases.

CASE 1.—Boy, aged 5. R.E., perforating wound in corneo-scleral region; prolapsed iris. Caused by a stone. Treatment :—Sodium salicylate, gr. vij., q.d.,

atropine, S.O., 7 weeks after injury. Enucleation. Nine days afterwards L.E. quiet. Discharged 8 weeks afterwards with V. = $\frac{1}{3}$.

Case 2.—Boy, aged 6. Perforating wound of limbus of R.E. Admitted three weeks after accident. Incarcerated iris. Enucleation. Sympathetic ophthalmia five days after operation. Sodium salicylate gr. xv, t.i.d. Eye became quiet. Discharged nine weeks after admission with V. = 0.8.

Case 3.—Man, age 19. Perforating wound of cornea from gonorrhœal conjunctivitis. Staphyloma corneæ follows. Staphyloma punctured. Patient discharged with eye almost quiet, but tender. Re-admitted three months after first admission with sympathetic ophthalmitis. Enucleation. Sodium salicylate, gr. xxx. t.i.d. Worse. Mercurial inunctions. Worse. Sodium salicylate, gr. xl. t.i.d. Great improvement, but subsequent phthisis bulbi.

Case 4.—Boy, age 12. R.E. perforating wound; prolapsed iris. Admitted four months after injury with sympathetic ophthalmitis, seclusio pupillæ and iris bombé. R.E. quiet, but iris slate-coloured. Sodium salicylate, gr. xv., t.i.d. L. iridotomy, and later attempted iridectomy. Both eyes got worse. Mercuria. inunctions and sodium salicylate without effect. Result five months after admission, V. R.E. $\frac{5}{200}$. L.E. $\frac{1}{200}$.

Case 5. – Man, aged 32. L.E. perforating wound of cornea and sclera with steel. Prolapsed iris. Enucleation refused. R. sympathetic ophthalmitis one month afterwards. Enucleation refused. Sodium salicylate. Ten days later enucleation. Sodium salicylate. Worse. Mercurial inunctions. Gradual improvement Result: full vision.

Lindahl's Cases.

Case 1.—Treatment: enucleation. Sodium salicylate and mercurial inunctions. V. improved by both from $\frac{5}{60}$ to $\frac{10}{60}$.

Case 2.—Treatment: enucleation. Sodium salicylate. Gradual improvement. V. = 0·8.

Case 3. Treatment: enucleation. Sodium salicylate. Rapid improvement from V. = fingers at 3-4 m. to V. = 0·15.

Case 4.—Sympathetic retino-choroiditis. Treatment: enucleation. Sodium salicylate. No improvement. Mercurial inunctions. Gradual improvement. Mild case. Full vision all the time.

Case 5.—Treatment: Ennucleation; sodium salicylate. Eye quiet in 12 days. V. = 1.

Case 6. – Treatment: Sodium salicylate. Improvement. Mercurial inunctions; deterioration. Sodium salicylate. Rapid improvement. Exciting eye improves from V. = 0·6 to V. = 1. Sympathising eye from V. = 0·2 to V. = 0·7.

Case 7.—Treatment: Sodium salicylate. Exciting eye atrophies. Sympathising eye improves to V. = 0·9.

Taking all the 12 cases together, Widmark claims a cure in 10 (83 per cent.), in 8 of which he attributes it to sodium salicylate (67 per cent.)* He compares these results with those of Schirmer, who obtained a cure in 5 out of 35 cases (14 per cent.), Fuchs in 3 out of 29 (10 per cent.), and Steindorf in 10 out of 42 (23 per cent.) He concludes with some statistics on the incidence of sympathetic ophthalmitis in Sweden, from which it would appear that the condition occurs more frequently in Sweden than in any other country. PERCIVAL J. HAY.

(5) In *La Clinique Ophtalmologique* will be found a *résumé* of the work which **Salmon** has published in *Annales de l'Institut Pasteur*, January, 1908. E. T.

(7) **Gonzalez** noted accidentally, while treating a case of ocular

* Five of these cases had been under treatment with salicylate before enucleation. The author thinks that this may have something to do with the good results. Most of the cases were early ones.

paralysis with the continuous current, that the intra-ocular tension of the eye was much reduced. He proceeded to investigate the action of the continuous current on other healthy eyes, and found the effect constant. The method of applying the current was to place one electrode, connected with the negative pole, over the eye, and to apply the positive electrode to the back of the neck. The current was then gradually increased until it reached 30 or 40 milliampères, and gradually diminished, so as to avoid the vertigo which is otherwise produced. The sittings lasted 15 minutes.

In all cases the tension was considerably lessened, and rose to normal again only after the lapse of 24 hours. By repeating the application daily, it was easy to keep the tension low for several days. Gonzalez has used this means of reducing tension in pathological conditions with good results in serous cyclitis with high tension, and in one case of acute glaucoma.

HAROLD GRIMSDALE.

(8) **Connor** (Detroit) returns to the question of vibratory massage, already noticed in these columns (see THE OPHTHALMOSCOPE, August, 1908, p. 642). Although no new facts are brought out, Connor's conclusions may be reproduced:

1. Vibratory massage places a new force at the ophthalmologist's disposal.

2. To the pressure and varied movements of finger massage the vibratory adds a great variety of vibrations, not only at point of contact with the eyeball, but simultaneously at all other parts and adjacent tissues of the orbit, and to an undetermined extent along the vessels and nerves. It cannot be doubted that such vibrations arouse to more normal activity all cells concerned in either eye nutrition or the acts of seeing.

3. Vibratory massage, under certain conditions, reduces ocular tension, accelerates intra-ocular circulation, clears the media, deepens the red reflex of the fundus, improves vision, and promotes ocular comfort.

5. Vibratory massage demands an instrument* adapted for use on the eye, its perfect control by the operator, a definite knowledge of existing pathological conditions, a full comprehension of the nature of the force employed, and common-sense in *technique*.

6. The best method of vibratory massage must be worked out separately in each case. If the symptoms be slight, massage may be more frequent and energetic. Some cases need daily treatment, others thrice, twice, or once per week, from one minute to ten minutes each time. Subjectively, patients are most improved by weak massage for a brief period; after long sittings

* The instrument for mechanical vibratory massage of the eyeball found most convenient and effective was made by the Whappler Electric Controller Co., 177 E. 87th Street, New York. The same instrument is capable of giving oscillatory pneumo-massage if desired.

they do not see so well, but later improve. No pain should accompany or follow the treatment.

7. Present experience encourages further work in this field.

(9) In *La Clinique Ophtalmologique* will be found a *résumé* of **Terson's** paper on wounds of the eye, communicated to the *Société Française d'Ophtalmologie*, 25th Congress.*

ERNEST THOMSON.

(10) **Hawley** has seen great improvement in old corneal opacities after the prolonged use of dionin.

HAROLD GRIMSDALE.

(11) **Evans'** paper consists of (1) a shortly detailed account of 30 cases in which Calmette's reaction was tried. The cases were conjunctivitis, dacryocystitis, episcleritis, phlyctenular keratitis, kerato-iritis, iritis and iridocyclitis, choroiditis, retinitis. There were 9 positive and 21 negative results. The author accounts for the small number of positive results by supposing that some slight reaction may have been overlooked. As regards drawbacks to the test, the author has found that the reaction "may be sufficiently severe to cause considerable discomfort for some days . . . . whilst it is comparatively common to find phlyctenular conjunctivitis developing after the application of the test." (2) A review of literature on the subject of eye treatment by tuberculin. ERNEST THOMSON.

(12) **Alger** (New York City) believes that there are three ocular conditions which are conceivably concerned in migrainous attacks: over-use of the ciliary muscle in accommodation, impossibility of binocular fusion without undue strain upon the exterior ocular muscles, and cerebral fatigue from constant interpretation of distorted and irregularly-sized retinal images. The author emphasizes the necessity for cure by thorough and repeated study of both the local and the general conditions, with careful and judicious employment of therapy.

CHARLES A. OLIVER.

(13) **Fox's** communication on the value of the morphine derivatives in ocular therapeutics resolves itself into a discussion of the uses to which dionin may be put in eye work. The author usually employs that medicament by subconjunctival injection, and is emphatic with regard to its value when thus used in acute interstitial keratitis which has resisted all forms of mercurial treatment. On the other hand, in the form of ointment dionin has little if any value in the treatment of long-standing opacities of the cornea. Dionin is valuable in the marginal ulcerations of old people, as well as in dendritic ulcerations of the cornea. Fox has had "surprising results" in 20% of his cases of detached retina by drawing off the subretinal fluid, rest, and the subsequent subconjunctival injection of dionine. Fox confirms the advantages of dionin in cases of painful irido-cyclitis,

*For review see THE OPHTHALMOSCOPE, June, 1908, p. 467.

an affection in which he uses a 5% solution either dropped into the eye or (better) applied by the subconjunctival method. In acute glaucoma the drug is not recommended. Fox once noticed contraction of the pupil follow the application of dionin to an eye which had been needled for soft cataract and of which the pupil was dilated by atropine. The contraction of the pupil coincided with chemosis of the conjunctiva, and passed away *pari passu* with the latter. SYDNEY STEPHENSON.

(14) **Leprince** recommends x-rays in the treatment of facial neuralgia, of which he publishes six successful cases. In general, two *séances* a week suffice, but in severe neuralgia the author advises a daily *séance* for four consecutive days, followed by a week's rest. SYDNEY STEPHENSON.

(15) Three points appear to emerge from the incomprehensible jumble published by **Langheld**:—1. That opacities in the vitreous humour may be caused by gout; 2. That such cases can be recognised by the presence of indican in the urine, as well as by fluctuations in the quantity of uric acid; and 3. That the conditions yield to the injection of spermin and the administration of the Fachingen mineral water. The communication, a curiosity from the literary point of view, abounds in words, the meaning of which is probably quite as obscure to the writer as it certainly is to the reviewer.

SYDNEY STEPHENSON.

(16) **Brav** (Philadelphia) recommends a 25 per cent. solution of glycerite of tannin, mild antiseptic lotions, and massage at bedtime with the yellow oxide of mercury ointment in the treatment of blepharitis. In cases accompanied by considerable itching, he has obtained benefit from an ointment containing one grain of salicylic acid to one drachm of lanoline. The application of a 1 per cent. solution of silver nitrate to the conjunctiva in these cases is, moreover, very valuable.

SYDNEY STEPHENSON.

(17) **Yvert** (Dijon) repeats the warning already familiar to all ophthalmic surgeons, never to use a salt of mercury, as calomel, to the eye if the patient is taking any preparation of iodine internally. He points out that a similar precaution should be adopted in departments of medicine other than ophthalmology, and quotes a case, reported by André, in which a patient, who was taking potassium iodide and employing injections into the urethra or bladder of mercury oxycyanide, developed a violent cystitis, accompanied by hæmaturia, and frequent and painful micturition. Yvert notes that the irritating and caustic effects of the nascent mercuric iodide have been intentionally employed in the treatment of tuberculosis of the mucous membranes by Hollander, Hirschberg, and Frank. SYDNEY STEPHENSON.

BOOK NOTICES.

The Pathology of the Eye. Volume IV. General Pathology, Part II. By J. HERBERT PARSONS. London: Henry Frowde, Oxford University Press, and Hodder and Stoughton, Warwick Square, E.C. 1908. Price 15s. net.

Volume IV of Parsons' *Pathology of the Eye*, just issued by Frowde, Hodder, & Stoughton, deals with the general pathology of the eye, and brings this magnificent work to a conclusion. In this case we are glad to recall the fact that, contrary to the rule, the prophet has enjoyed some honour in his own country, since the Ophthalmological Society of the United Kingdom has awarded to Mr. Parsons the Nettleship Gold Medal for his work.

The present volume includes an account of injuries of the eye and orbit, exophthalmos and enophthalmos, panophthalmitis, orbital cellulitis and thrombosis, sympathetic ophthalmia, heredity, and symptomatic diseases of the eye. From the pathological point of view, these various subjects are treated with the same thoroughness which characterised Mr. Parsons' other three volumes. References to literature, British and foreign, are voluminous. There are numerous black-and-white illustrations. It would be impossible in the space at our disposal to review adequately the mass of information brought together by Mr. Parsons. We shall content ourselves by saying that the completed work is a magnificent tribute to British ophthalmology, and as such we thank Mr. Parsons for it. It may now be claimed, without fear of contradiction, that the most complete work on the pathology of the eye is that of a British writer, Mr. Parsons, to whom we tender our hearty congratulations on the completion of his onerous work.

Manual of Ophthalmic Surgery and Medicine. By WALTER H. H. JESSOP, M.A., M.B., F.R.C.S., Senior Ophthalmic Surgeon to St. Bartholomew's Hospital, London. Second edition, pp. XX and 531, with 155 illustrations in the text, 9 coloured plates, and 12 photographs. J. & A. Churchill, London, 1908. Price, 9s. 6d. net.

There are many elementary text-books of ophthalmology published in English. A very definite proportion of these do not seem to have any obvious *raison d'être* beyond that of giving an opportunity for their writer's name appearing more or less conspicuously in the advertisement columns of medical publications. Jessop's manual most distinctly does not belong to this class. The present reviewer has regarded it for years past as one of the most useful books to recommend to students commencing the study of ophthalmology, and he welcomes the

appearance of this new edition, with its wealth of illustration, its beautiful photographic plates, reproduced from Dimmer's photographs, and its general up-to-datedness. The book has undergone a thorough revision, and while the nature of such a work demands dogmatic statements, on all matters of dispute the writer holds to that middle way in which it is safest for the student to walk. We feel sure that this new edition will have, as it deserves, as wide a circulation as its predecessor.

LESLIE PATON.

Hygiène Oculaire et Inspection Oculistique des Écoles. By H. TRUC and P. CHAVERNAC, with a preface by C. M. GARIEL. Second edition. Paris: A. Maloine, 25-27, Rue de l'École de Médecine. 1908. Price, 5 francs.

This small book of 242 pages deals briefly and popularly with the hygiene of the eye and with the ophthalmic inspection of schools. To characterise it as a mere compilation would not be unfair. It professes to be no more. Elementary ideas of the anatomy and physiology of the eye occupy the first twenty-six pages. Then follow ten pages dealing with errors of refraction, and eleven pages with some of the commoner diseases and injuries of the eye. The section last-named concludes, curiously enough, with some remarks upon the necessity of holidays. Sections follow on the site, construction, lighting, and furnishing of schools, and an account is given of what has been done in these respects in countries other than France. The last twenty-five pages of the book are devoted to an account of the ophthalmic inspection of schools and scholars. The volume concludes with a bibliography. SYDNEY STEPHENSON.

The Muscles of the Eye. Vol. I.—Anatomy and Physiology. By LUCIEN HOWE, M.D., M.A. G. P. Putnam's Sons, 27-29, West Thirty-third Street, New York. 1908. Price, $4·50 net.

This book is an important addition to ophthalmic literature, and seems to us, after careful perusal, to be in all respects extremely good. It is excellent alike on the physiological and on the clinical sides and is one which should be studied carefully by ophthalmic surgeons and even by advanced ophthalmic students. The author starts from the very beginning; he discusses the anatomy of the orbit and of its contents, and so thorough is his work that he devised altogether new methods of making anatomical preparations.

The sections dealing with the origin and insertions of the muscles are particularly good. He gives the measurements made by authors who have previously written on the subject and also those at which he arrived after careful measurement. Nowhere have we seen a better or more clear account of the connective

tissue of the orbit and of the check ligaments. In addition to the above subjects, the anatomical part deals with the intra-ocular muscles and structures in general which are involved in accommodation. There are also full sections dealing with the nerve supply of the various muscles, both as regards the portions of the brain involved and the peripheral distribution of the nerves.

We congratulate the author on the ingenuity which he has displayed in altering the ordinary ophthalmometer so as to make it serve the purposes of Tscherning's ophthalmophacometer The diagrams which are inserted of the cranial nerves which have to deal with the eyeball and with those parts of the brain which are involved are particularly good. They are taken from a large number of sources, and consequently the ophthalmic surgeon has here conveniently brought together a number of diagrams by different authors, which make this part of the book of great value for reference. It will save him a great deal of trouble in looking up a large number of anatomical text-books. As showing the thoroughness with which the work has been carried out, the anatomical portion ends with a chapter on the comparative anatomy and embryology of the ocular muscles.

The second portion of the book is taken up with the physiology of the subject, and seems to us to be a complete answer to those who believe that a moderate amount of mathematical and physical training is not necessary to the study of ophthalmology. In the early part of this section there is an excellent account of the geometry of the eyeball, and of the determination of the centre of motion which the author effects tolerably simply with the ophthalmometer.

The constants which he employs are those of Helmholtz. *Inter alia*, we notice that he uses the phrase "angle alpha" in precisely the same way as did Donders. This means, the angle between the visual axis and the optic axis of the eye. The second chapter is devoted to the consideration of accommodation and of the investigation of this function. In this the author gives a very clear and impartial view of the evidence as regards the action of the ciliary muscle during the act of accommodation. He does not give any dogmatic opinion of his own, but concludes by saying: "From the facts thus far collected it must be conceded, however, that the *balance of evidence favours the conclusion that the zonula does relax*, and, in a word, that the so-called Helmholtz theory, perhaps with some modification, is nearest to the truth." In this chapter an extremely good section on the action of mydriatics and myotics is to be found. The results obtained by experiment are well indicated by graphs.

The movements of the eyes next receive adequate attention. The author begins by describing the various forms of ophthalmotropes, and this section includes a very satisfactory description of his own. It seems to be an instrument well adapted for the purpose of illustrating the movements of the eyes. Probably, it is one of the most satisfactory of all obtainable.

After mentioning the muscles involved in each direction of fixation, a full account is given of the methods of investigating the field of fixation, and under this heading we have an account of the author's method for measuring the lifting power of the adductor muscles. The section on the testing of the various forms of heterophoria and orthophoria is excellent. It seems to us to be a complete review practically of the whole subject and one which well merits attention.

Take it altogether, Lucien Howe's work is perhaps the best review of this subject yet published, and we cordially recommend it to all who are interested in the physical side of ophthalmology. In addition, it contains a great deal of first-rate original work.

FREELAND FERGUS.

Avis au Peuple sur la Conservation de la Vue, et sur les Moyens de la Retablir. (Advice to the public on the preservation of sight and upon the means of restoring it when impaired.) Mémore inédit de Pellier de Quengsy, avec une notice biographique. Par J. COULOMB, Docteur en Médecine. Montpellier: Société Anonyme de l'Imprimerie générale du Midi. 1908.

Dr. Guillaume Pellier de Quengsy was the most remarkable representative of ophthalmology in the University of Montpellier at the close of the XVIII and commencement of the XIX century. A school of medicine existed in this city from about the middle of the XI century which was the resort of students from many countries for centuries It produced a large number of able men, amongst whom the most prominent were Vesalius and Paul Joseph Barthez (1739—1806), but the knowledge of diseases of the eye was too limited to render the institution of a special chair necessary until the year 1788, when, following the example set by l'Ecole de Chirurgie, in Paris, and incited by the discovery of the seat and nature of cataract, and by the operation practised by Daviel for its removal, a chair of ophthalmology was instituted. Guillaume sprang from a family known to be skilful oculists. After obtaining the degree of Doctor of Medicine, the date and even the university which conferred it upon him being now unknown, he seems to have adopted a wandering life and to have visited Auxerre in 1772, and in subsequent years Langres, Avallon, Thonon, Verdun, Varennes, St. Ménéhold, Angoulême and many other of the large towns of France, settling down in 1776 at Montpellier, becoming *oculiste en titre* to that city. The French Revolution left him with only half his name, the *de Quengsy* probably savouring sufficiently of aristocracy to render its retention dangerous, and he appears henceforth as Pellier only. In 1782 he published his first work, *Recueil de Mémoires et Observations*

sur les Yeux. In 1799 he endeavoured to obtain—and perhaps did obtain—the Cross of the Legion of Honour, and in 1835 died at the advanced age of 84 years.

The treatise before us is an unpublished memoir long supposed to be lost. It shows very clearly the ideas of pathology and the modes of treatment in vogue in France at the close of the XVIII century. He commences with an account of inflammation of the eye, of which he recognises ten forms not very well distinguished from each other, by degrees of redness, intensity of pain, and obscurity of vision, and proceeding from simple conjunctivitis to abscess of the cornea, hypopyon, and hyphæma. Their causes he divides into internal or constitutional and external. The constitutional treatment recommended in many of the latter cases is quite in accordance with the best methods then in vogue, whilst the external causes seem to have been the entrance of foreign bodies, which he removed with delicacy and skill, with subsequent employment of soothing lotions and rest of the eyes. In a case of ecchymosis of the conjunctiva he very prudently, as there was no pain and he was unable to find any cause for it, restricts his treatment to cold water to which a few drops of spirit had been added. Cases of abscess and ulcer of the cornea, with or without perforation, he treated with an opiate lotion. He distinguishes very well between a prolapse of the membrane of Descemet, or, as he often terms it, membrane of the aqueous humour, and one of the iris, treating this last with a point of nitrate of silver or with a paint brush applied after being charged with "glacial oil of antimony" and an opiate. He records a remarkable case (p. 97), apparently one of kerato-globus, which he treated and, according to his account cured, by the local application of tobacco and sulphate of zinc, paracentesis, bandages, emetics, blisters behind the ears, mild purgatives, and arnica, vision, which was beginning to be impaired, being perfectly restored. No comments need be made on the account here given of hypopyon or of hydrophthalmia, except to remark on the variety of physics which it was customary to prescribe, such as barley water with honey, rice water, veal broth, chicken broth, and mutton decoction, adding to each a spoonful of Glauber's salt.

His mode of operating for cataract, which was in opposition to the method of couching then generally adopted, consists in making an inferior section, pressing the upper part of the globe with the knife and the lower part with the index of the other hand, thus facilitating the escape of the lens. In secondary cataract he holds the membrane with a pair of spring forceps. Great reliance seems to have been placed on simple remedies, now wholly neglected, such as ptisanes or infusions of various plants, such as lettuce, chicory, sarsaparilla, cold baths of river water, the application of the actual cautery, or of blisters to the area, chalybeates, the breathing on the eye of a person who had

been chewing, which collectively effected great improvement in the eyes after their adoption. In many cases private prescriptions are recommended, the formula of which are not given but which are indicated by numbers.

Glaucoma is, in M. Pellier's opinion, a disease of the vitreous, recognisable by the subjective symptoms of fog, muscæ volitantes, loss of vision and pain, and the objective symptoms of sluggish pupil and of greenish discolouration. The causes of the disease are the suppression of periodical discharges, or the cure of long-standing ulcers. The treatment is again simple, consisting of injections, embrocations, aperient infusions and decoctions, infusion of sarsaparilla and chicory, antimonial preparations and opiates and quinine—nothing, in fact, likely to prove of the slightest service in that disease. Diseases of the retina were misunderstood, and it would be waste of time and space to describe the views that were held in preophthalmoscopic times.

The work is sensibly written for the time it was composed, but except as representing the doctrines then in vogue, and as a curiosity of medical literature, it hardly seems to be worthy of reproduction. HENRY POWER.

Cataract Extraction. By H. HERBERT, F.R.C.S., late Lieutenant-Colonel I.M.S., Professor of Ophthalmic Medicine and Surgery Grant Medical College, and in charge of the Sir Cowasjee Jehangir Ophthalmic Hospital, Bombay. London: Messrs. Baillière, Tindall, & Cox, 1908, pp. viii. and 391, 97 figures. Price, 4s. 6d.

This work is an expansion of Colonel Herbert's previous publication, *The Practical Details of Cataract Extraction*, of which two editions appeared in 1903. It contains new material collected from a wider experience based on about five thousand extractions. It may be said at once that the author has succeeded admirably in his attempt "to present an up-to-date treatise, as complete as desirable from a practical point of view, and likely to be of service even to older surgeons who may have already formed their opinions and established their procedure."

The six chapters into which the book is divided deal with "Operable cataract"; "Description of the operation"; "Expulsive hæmorrhage"; "Vitreous accidents"; "Variations in procedure and their value"; "After-complications" and "Complicated and soft cataracts."

In discussing operable cataracts three main types of change in senile cataract formation are recognised: (1) liquefying cataracts which become Morgagnian when overripe, (2) shrinking cataracts where there is never evidence of excess of fluid within the lens, and (3) slow hypersclerosis—"black cataracts." Under type (1) the statement is made: "actual measurements taken in Bombay show that some Morgagnian lenses are

above the normal in volume," which is not what one would have expected. For clinical grouping of the different varieties of senile cataracts is a very difficult matter, and one about which much confusion and difference of opinion exists. Colonel Herbert's classification, which is much the same as that adopted by Graefe in 1884, is of practical importance from the point of view of extraction. In the East, extraction has often to be performed under unfavourable conjunctival conditions. Preliminary treatment is often not possible and reliance has to be placed in free perchloride douching (1 in 3,000). The author says: "experience has shown that provided the secretion is only scanty and mucoid, scarcely any changes in the palpebral conjunctiva necessitate delay in operating." We disregard papillary roughness, thickening, scarring, minute cysts, small follicles in the fornices, and scanty remains of confluent pale, lymphoid, trachomatous tissue. Flat dressings the night before operation are used for untreated cases, not for those just described. If discharge is set up by it in an apparently healthy eye, it is regarded as more serious than if produced in an eye with an obviously unhealthy conjunctiva. Extirpation of the sac is strongly urged in all cases of dacryocystitis. Few will be found, we think, to agree with the statement—"it is accepted that infection of the conjunctiva from the nose, by way of the lacrymal passages, does not take place."

The description of the operation, which takes up 137 pages, is very elaborate. It begins with a short historical account of cataract extraction, and after describing the instruments in use, general arrangements of operation room, and preparation of the patient, the description of the combined extraction is given. Adrenaline solution is always used before cocaine to enhance the anæsthetic effects, lessen bleeding, and, in simple extraction, the combination is said to "tend to reduce greatly the liability to prolapse of iris." Nothing is said of the danger of reactionary hæmorrhage, which is not uncommon after the use of adrenalin. The combined extraction with conjunctival flap and iridectomy is regarded as the "standard" operation, as "in many cases it is the only operation at all suitable, and is performed almost exclusively by many surgeons, and is especially the operation for beginners." The incision lies purely in corneal tissue, and comprises the upper two-fifths or less of the cornea. In performing the iridectomy, the iris is seized midway between its base and the pupillary margin. The object of this is to remove as little as possible of the sphincter. "Active sphincter muscle fibres are one of the chief preventives of subsequent prolapse or incarceration of the iris in the wound." The danger of seizing the iris too near its periphery and buttonholing it, leaving a band of tissue separating the coloboma from the pupil, is mentioned. The capsule is opened by a long vertical cut up the centre, ending with a horizontal movement of the cystitome to either side near the wound. In the delivery of the lens by

pressure below with hook or spoon, stress is laid upon the assistance that can be given by fixation forceps applied to the conjunctiva below the cornea in the left hand, which causes a downward pull on the eye and slight gaping of the wound. It is said to be particularly useful in unripe cataracts and in those with soft cortex—lenses of rather opposite characters, by the way. During delivery "undesirable evidences of excessive or of deficient tension in the eye" may be met with—alarming tendency to expulsion of the contents of the globe, or falling back of the cornea to occupy the space resulting from loss of the lens and aqueous humour. The two conditions seldom bear any relation to the tension of the eye as tested clinically before operation. The latter is, of course, due either to rigidity of the sclera or to unusual thinness of the cornea. The former condition is more difficult to explain—vitreous tension, as the author calls it—in the absence of signs of increased intra-ocular tension.

In the toilet of the eye, cortex, blood and iris pigment are removed by expression, if possible, and, failing that, by intra-ocular irrigation with normal saline solution by McKeown's method. The pillars of the iris coloboma are pushed together by the curette, the conjunctival flap is smoothed out, and the speculum is removed. Any further mucus that has collected from the strong perchloride stimulus is removed from the conjunctival sac by passing a curette lightly over it, atropine is instilled, and the eyes are bandaged and a shield is applied.

In the chapter on "Variations in Procedure and their Value" (p. 103) all the various details in the operation are exhaustively considered, and the numerous modifications in their mode of performance by different surgeons are given. A good deal of ground already covered is gone over again, but perhaps repetition is unavoidable and not altogether inadvisable. The book would have gained in clearness of exposition, however, as well as in size, if the variations in procedure had been more strictly confined to this chapter, and the description of the operation had excluded all but details of the operations as performed by the author. The various procedures practised by different surgeons are fairly given, with the arguments for and against them. Upper and lower and lateral sections are discussed, also Schulek's and Müller's double-flap sections. Parinaud's, by the way, is not mentioned. Czermak's subconjunctival extraction finds prominence and much approval as a safeguard against secondary infection. Suture of the cornea, before the section (Kalt), is not regarded favourably. As regards simple *versus* combined extraction, Colonel Herbert well says that the question is no longer which is the better method?—but, rather, in which cases should the simple operation be attempted? and these, as they appear suitable, are indicated at some length. Peripheral iridectomy, as performed by various operators, is discussed, but in all cases it is described as being done *before* the delivery of the lens;

in fact, the lens was apparently removed through the peripheral coloboma thus made. The essential feature of a peripheral iridectomy, however, is that it should be done *after* the lens has been expelled. It is done to prevent prolapse, by providing a sluice for the escape of aqueous, and not to assist expulsion. Expulsion is rendered more difficult by it. Various methods of opening the capsule are described—preliminary, as performed in Madras, and peripheral, as performed by Gayet and Knapp. Removal of the anterior capsule with forceps, instead of capsulotomy, does not find favour with the author, although his experience of it is admittedly small. Removal of the lens in its capsule is described, as performed chiefly by Major Smith, I.M.S., at Jullundur, and its history from the time of Pagenstecher (1865) and Macnamara (1871) in Calcutta is given. Mulroney, at Amritsar, in 1890, made a downward section and expelled the lens by manipulation through the lids. Smith adopted the upper section, added an iridectomy and expressed the lens by means of a strabismus hook, removing the speculum before the expression. The advantages and drawbacks of the operation are fairly given. Extensive quotations are made from the chapter on the operation in Maynard's *Manual of Ophthalmic Operations*, recently reviewed in THE OPHTHALMOSCOPE.* The remarks on *asepsis* are very much to the point, and the necessity of compromise where the field is one that cannot be perfectly sterilised, is laid stress upon. In Bombay a 1 in 3,000 solution of sublimate was used and found to reduce the infections in a remarkable manner. In Colonel Herbert's last 1655 extractions there were no suppurations, only two cases of iritis, two of sympathetic disease, and one of chronic cyclitis. Truly can he say, "We can claim, therefore, a near approach to perfection in final results in this last series of operations, so far as uncontrolled infective inflammation is concerned." The use of mouth-screens and extra precautions in intraocular irrigation are regarded as also contributing to these results, which are all the more surprising where the admittedly bad condition of the Bombay conjunctivæ is borne in mind. Under "After-Complications" are discussed "infective processes and non-infective reactions" (the existence of the latter being rather a matter of doubt to many), forms of corneal opacity, exfoliation of corneal epithelium, prolapse and incarceration of iris or vitreous or capsule, intraocular hæmorrhage, and other complications met with after extraction. Glaucoma secondary to extraction or needling is discussed and the unusual freedom from it met with in Bombay is considered largely due to the use of the conjunctival flap, which not only led to the formation of many filtering cicatrices, but also ensured early refilling of the anterior chamber and prevented downgrowth of epithelium. The section on after-cataract is very full (44 pages), early discission—about the eleventh day—being advocated with

* THE OPHTHALMOSCOPE, June, 1908.

Graefe's knife ground down to below a millimetre in width and inserted subconjunctivally. The last chapter deals with complicated and soft cataracts.

Enough has been said to show that Colonel Herbert has written a book of great importance to ophthalmologists. It represents the fruit of a ripe experience and abounds in practical details which only such experience, united with keen powers of observation, could have produced.

F. P. MAYNARD.

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CONTENTS.

Original Communications –

1. A. F. MACCALLAN, M.B., B.C., F.R.C.S. —Ophthalmic Conditions in the Government Schools in Egypt and their Amelioration ... 856

Clinical Memorandum—

1. Lieut.-Col. F. P. Maynard, F.R.C.S., I.M.S.—A note on the Seasonal Prevalence of Acute Glaucoma 864
2. A. Yale Massey, B.A., M.D.—A Case of Persistent Capsulo-Pupillary Membrane in both Eyes 866
3. Percy C. Bardsley, M.A., M.B., B.C. —A New Scotometer: together with the Description of a Case where it was found of service ... 867

Novelties –

1. Herbert Tanner, F.R.C.S.—A Bi-Manual Ophthalmoscope 872
2. Platyscopic Spectacles for the Partially Blind 874

Review—

Some of the Newer Operations upon the Eye and its Appendages. By Harold Grimsdale, M.B., B.C., F.R.C.S. 875

Translation—

Professor Th. Axenfeld.—The Share of the Ophthalmic Surgeon in the operative treatment of the Accessory Sinuses of the Orbit ... 888

Current Literature—

I. The Cerebral and Ocular Complications of Anæmia 895
II. Visual Fields in Pigmentary Retinitis 897
III. Regional Anæsthesia 898
IV. Photography of the Fundus Oculi 899
V. The Valves of the Lacrymo-Nasal Passages 900
VI. Basedow's Disease 903
VII. Congenital Anomalies 904
VIII. Xeroderma Pigmentosum 913
IX. Etiology of Acute Conjunctivitis 914
X. The Eyesight of School Children 915
XI. Traumatic Enophthalmos 917
XII. Remedies... 918

Book Notices 926

Correspondence 932

Notes and Echoes 936

ORIGINAL COMMUNICATIONS.

OPHTHALMIC CONDITIONS IN THE GOVERNMENT SCHOOLS IN EGYPT AND THEIR AMELIORATION.*

BY

A. F. MacCallan, M.B., B.C.Camb., F.R.C.S.Eng.

CHIEF OPHTHALMIC INSPECTOR, PUBLIC HEALTH DEPARTMENT, EGYPT.

Part I.

At the last Annual Meeting of the British Medical Association, I had the honour of reading a paper describing the work which had been carried on in Egypt by the ophthalmic hospitals during the previous four years.** This year, previous to giving some detailed information with regard to the ophthalmic conditions in one of the largest Government schools, I propose to report shortly on last year's (1907) clinical work at the two travelling hospitals.

The number of new patients treated was 7,446, about one-third of the actual applicants. The average number of attendances of patients under regular treatment was 19. 3,173 patients were seen who were incurable and who were sent away after the first examination.

The total number of operations performed was 6,794, of which 194 were for the removal of cataract. 2,175 cases of absolute blindness were seen, in 326 of which the cause was primary glaucoma.

The number of patients blind in one or both eyes was 8.7 per cent. of the total number examined.

2,197 persons were seen who had been operated on by charlatans for trichiasis; in most of the cases lagophthalmos had been produced without curing the trichiasis.

The work has been carried on during the last year by the two travelling hospitals originally established by Sir Ernest Cassel. One new permanent hospital, established and maintained by the Government, will be opened this year, and one permanent hospital, built partly by local effort but maintained by the Government, will be opened next year.

The Egyptian Government has been kept fully aware of the ophthalmic needs of the country during the last year by Mr. Graham, the Director-General of the Public Health Department; and it is probable that money for further ophthalmic relief will be forthcoming from the Ministry of Finance as soon as funds become available.

*A communication read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, July, 1908.

**Published in The Ophthalmoscope, September 1, 1907.

PART II.

Means of Education in Egypt.

Education is carried on in Egypt, mainly by the Ministry of Education, by means of primary schools established in Cairo and Alexandria and in the capital town of each province; and by means of secondary schools established in Cairo and Alexandria.

At the primary schools the goal of the pupils' ambition is the primary certificate, without which he cannot enter the Government service as a clerk, and at the secondary schools the object to be attained is the secondary certificate or baccalaureate, a necessary qualification for the higher Government posts and for admission to the schools of medicine, law, etc.

The school with which I have had to deal is one of the provincial schools containing nearly 500 pupils.

Attention Previously Paid to the Ophthalmic Condition of the Schools.

The late Chief Medical Officer of the schools, Dr. Eloui Pacha, himself an ophthalmic surgeon, on various occasions drew attention to the prevalence of trachoma among the pupils, and during his tenure of office the hygienic conditions were greatly improved; but it is obvious that he himself, in the absence of a trained staff of ophthalmic surgeons, could do little or nothing in the way of treatment on a large scale.

Proposals for Ophthalmic Treatment.

Attention was drawn by me to the condition of the schools in 1904, but it was not until 1907 that my knowledge of the country and of the schools was complete enough to enable me to draft a proposal for the treatment experimentally of one school.

Financial Aid from Public Health Department.

My proposal, however, was likely to have fallen on stony soil (for the Minister of Education had no fund at his disposal which would have enabled him to assist financially in any form of treatment) had not the Director-General of the Public Health Department come to the rescue with funds which enabled me to commence at Tantah, in October, 1907, the treatment of a school of 485 boys.

Difficulties under which the work was carried out.

The novel conditions under which work had to be carried on, and in deference to the educational authorities, the very much less thorough methods than those which I originally hoped to adopt, delayed the completion of any routine plan and has diminished the value of the results which I hoped to show.

It is probable that my original intentions were too drastic considering that they would no doubt have interfered to some extent with the curriculum and interrupted the normal course of instruction.

It is, nevertheless, a matter for congratulation that 87·2 per cent. of the pupils who were treated showed improvement at the end of six months (although many of them attended very irregularly), while of the untreated only 5·9 per cent. were better at the end of the same interval.

Of the non-trachomatous scholars, 21 in all, it is noteworthy that 15 pupils became infected with trachoma during the period October to June; these pupils, of course, had received no treatment previous to infection.

Cause of the Prevalence of Eye Disease in Egypt and Nature of the Disease.

Trachoma has been endemic in Egypt for untold centuries. It is less than the truth to say that it is widely disseminated, for it is comparatively rare to find anyone above the age of twenty years who exhibits no trace either of active or passive trachoma.

It is usually only in the presence of conjunctival irritation that infection by trachoma occurs. Now, in Egypt causes of conjunctival irritation are ever present.

The uncleanly habits of the lower classes, habits in some cases consecrated by custom, and in others aggravated by the difficulty in obtaining water; the crowded huts with crumbling mud walls in which the poorer fellahin sleep together with their cattle; the dust of the streets, unpaved and unwatered except in a few of the larger towns, and continually ground to powder by the trampling of the cattle which are daily driven from the huts to the fields; the gales of daily occurrence during some periods of the year, and without which Egyptian villages would be perfect death-traps, drive this dust about until it permeates the whole atmosphere; all these are fertile causes of conjunctivitis.

While the poorer classes by their habits, which cannot be changed by law or by decree, are constantly suffering from conjunctivitis, the ubiquitous virus of trachoma is ever ready to attack a conjunctiva, the resistance of which to infection has been lowered.

The richer classes, again, are infected by their servants, who are drawn from the highly trachomatous classes.

In addition to trachomatous conjunctivitis, there are at various periods of the year outbreaks of purulent conjunctivitis, due to the Koch-Weeks' bacillus and to the gonococcus, as well as to other organisms. Meyerhof* believes that these outbreaks occur at stated and fixed periods depending on the atmospheric

(*) Annales d'Oculistique, 1906.

temperature and on the temperature most favourable to the multiplication of these organisms.

While it is probable that the non-secreting or passive form of trachoma is not very infective, the super-imposition of a purulent conjunctivitis on a passive trachoma renders its subject infective both of purulent conjunctivitis and of trachoma. In a patient, previously healthy, infected in this way, it is usually the case that not until the conjunctivitis has run its course do the signs of trachoma manifest themselves. This is the condition which has been called acute trachoma, a term which has done more than any thing else to obscure the clinical history of the disease. It is the condition in all probability which resulted in so much blindness among the participators in the various expeditions to Egypt in Napoleonic times, who, when the acute symptoms of purulent ophthalmia had subsided, exhibited the signs of trachoma. The theory that trachoma, now a chronic disease, was formerly more virulent and of an acute type, has, in my opinion, no foundation.

Trachoma is a purely local disease caused by an unknown but specific organism from which no race is immune, and which attacks with greater severity the individuals of a heavily trachomatised than the individuals of lightly trachomatised nations. I do not, of course, suggest by this that the severity of the disease depends on anything more than on the personal habits of the individual and the conditions under which he lives.

The absence of even a relative immunity among the individuals of any nation renders the diminution of virulence theory improbable.

Stages of Trachoma.

Various forms of trachoma have been described by authors, such as Fuchs, Stellwag, Peters, Boldt, and others. These forms are well-known, but during the last three years I have found it serviceable for clinical purposes to divide trachoma into stages in accordance with the life-history of the disease.

Trachoma is a condition of the mucous membrane of the eyelids, in which gross changes occur, resulting in the formation of so-called granulations (with or without a papillary hypertrophy), which in favourable cases disappear, and are replaced by connective tissue. My classification of four degrees is based on the comparative prominence of the three features—granulations, papillary hypertrophy, and connective tissue formation.

Trachoma I is the beginning of the disease, and trachoma IV is its end when a cure has resulted (either naturally or by treatment).

Trachoma I is well described by Hourmouziades : " One finds on the conjunctiva of the tarsus and of the superior *cul-de-sac*, especially at the two extremities of the tarsus, slight roughnesses,

forming grayish or grayish-yellow islands which are semi-transparent and almost avascular, with small blood vessels converging towards them. These roughnesses are larger in the *cul-de-sac* than on the tarsus, and generally resemble grains of sago. There may or may not be a mucous discharge."

This simple form does not last very long, for after the development to a certain degree of the granulations, the conjunctiva becomes easily vulnerable; inflammation sets in, and complications with other species of conjunctivitis than trachoma occur.

This form may pass into trachoma II, or in favourable cases, or cases which have been treated, into trachoma III.

Trachoma II is the stage in which granulations are numerous and large, or in which a papillary hypertrophy is present. It may be divided in the above sense into trachoma IIa, and trachoma IIb.

Trachoma IIa.—Gelatinous granules are present all over the tarsi and in the upper fornix. In some cases the individual granulations can no longer be distinguished, and they fuse into tumour-like masses or merge into a general infiltration, the tissue assuming a peculiar glassy gelatinous appearance.

Trachoma IIb.—There is formation and hypertrophy of pseudopapillæ consisting in red raspberry-like elevations which mask more or less the typical gelatinous granules. This papillary form, as it is called, is especially marked on the upper tarsus. This form may easily be mistaken for spring catarrh and for a condition occurring as the result of any long-continued irritation or of a protracted attack of purulent ophthalmia in non-trachomatous eyes (*fausses granulations*).

Trachoma III.—In this stage cicatrisation has definitely begun, and is more or less advanced. Islands of inflamed conjunctiva or of trachomatous granules are seen to be surrounded by a network of fine lines of connective tissue. It is in this stage that necrosis of tissue often results from the pressure of the shrinking connective tissue (post-trachomatous degeneration). The necrotic tissue may become calcareous. The cicatrisation which is typical of this stage is generally supposed to be pathognomonic of trachoma. It is often more or less marked in trachoma II, especially in the fornix, the part of the conjunctiva first affected, and the part also in which cicatrisation first appears.

Cicatrisation is said not to be a sequel of either spring catarrh or of "*fausses granulations*." Spring catarrh, however, is not uncommon in Egypt in combination with trachoma, and the subject of "*fausses granulations*" may contract trachoma.

Trachoma IV is a condition in which there is a smooth conjunctiva seamed by white lines of connective tissue. This is the stage of complete cicatrisation of the conjunctiva or of cured trachoma.

In order to arrive as quickly as possible at the stage trachoma IV, or at any rate at as late a stage of trachoma III as possible

(for the change from trachoma III to trachoma IV is a slow process), treatment is advisable and treatment may be (a) by the application of drugs to the conjunctiva; (b) by operative procedure combined with the application of drugs to the conjunctiva; (c) by operative procedure alone.

It is of course well-known that trachoma is a purely local affection depending on no diathesis or constitutional state, but purely on a local infection with an unknown but specific organism. Every effort in treatment must therefore be directed to the focus of disease.

The application of suitable drugs to the conjunctiva quickly results in an amelioration of the subjective symptoms; objectively, improvement is often long delayed, perhaps for many years, and this is true of trachoma I, trachoma II, and trachoma III. Curiously enough, it is often trachoma I which responds least readily to drug treatment.

One of the reasons why this stage, though frequently quite a slight affection, so often drags out such a long and weary course, is that surgical procedure is not sufficiently often applied.

Treatment by operation combined with drugs is commonly carried out by surgeons in Egypt for trachoma II, and it usually results in great improvement, both subjectively and objectively. The operation consists in scraping or squeezing the diseased conjunctiva and, later, in the application of mercury or silver salts.

Although by operation and the subsequent application of drugs a good deal of cicatrisation can soon be produced, and trachoma II thereby changed to trachoma III, it is difficult to induce patients who feel so much relieved to submit to further treatment in order to attain to the condition of almost complete cicatrisation trachoma IV.

Radical treatment of trachoma by operation is applicable to severe cases of trachoma II and trachoma III in which cicatrisation of the fornix has already occurred. The operation is known as Kuhnt's combined excision of tarsus and conjunctiva. It is a comparatively new operation, a description of which has not yet found its way into the text-books. Even Boldt's monograph gives no description of the operation, which, however, may be found in THE OPHTHALMOSCOPE for 1906, p. 575.

It is an operation from which I have had some exceedingly good results. The presence of granulations in the fornix contraindicates the operation, which should be performed only when fornical cicatrisation has already occurred.

The especially suitable cases are those in which there is considerable thickening of the lid in the stage trachoma IIa or trachoma IIb.

The first case I operated on was in 1906, and resulted in the almost complete loss of the patient's vision in one eye, as result of ulceration of the cornea. I was obliged to go away for

about a week immediately after the operation, and left the case in the hands of an assistant, who removed the sutures early but left a knot of silk on the lid rubbing on the cornea. If foolish mistakes of this kind are avoided, and the operation is performed with dexterity in suitable cases, the results are almost constantly satisfactory. I say almost and not quite because in the last case I did the superior *cul-de-sac* was much contracted and on the stretch, so that when I removed the tarsus with its superjacent conjunctiva, there was not enough conjunctiva left to bring down to the free border of the lid. I therefore brought down the conjunctiva as low as possible and put in a van Millingen's graft to cure the resulting entropium.

Facilities for ophthalmic treatment in Egypt.

To produce any real effect on an average case of trachoma by drugs alone, it is probable that two or three months' daily treatment would be necessary, and this does not necessarily mean cure but merely improvement. By operation followed by daily treatment considerable improvement can be effected in one month (change from trachoma II to trachoma III.)

Let us suppose a Government *employé* on £E10 a month has in his household ten persons, or let us say eight persons to be sure of no exaggeration, namely, himself, his wife, three children, a dependent relation, and two servants. It is almost certain that each one of them will be suffering from trachoma, it is probable that he and his wife will have trachoma III: of the three children one will have trachoma I, and the other two trachoma II; the relation probably has trachoma III and trichiasis; of the servants one has trachoma II, and the other trachoma III.

Now, what will it cost him to have the whole family treated? But perhaps such an idea is ridiculous, let us suppose that he wishes to obtain treatment for the two children with trachoma II only. He will take them to a surgeon escorted naturally by the servant with trachoma II, who hopes to obtain treatment gratis. He consults the surgeon, who tells him that the two children both require operative treatment and the daily application of drugs for a period of at least one month. The recognised fee for a visit to any doctor is one dollar, so the Government *employé* on £E10 a month is asked to expend for the treatment of the two children at least £E5 a month, even though the doctor agrees not to charge for the operation under choloroform necessary for each child, and to charge only a single fee for each child, and to charge only a single fee for each visit of the two children. Is it any wonder that the father either does not take them any more to the surgeon, but buys some drops at the chemist's, or that he continues the visits to the surgeon until some slight improvement is manifested in the children's eyes, and then promptly discontinues the visits.

A story such as the above is quite common in the towns

where skilled advice can often be had if it is paid for. But what is to be said as regards the inhabitants of the country districts who, even though willing to pay the full legitimate fees of doctors, live perhaps 5 or 10 miles from medical aid. How are they to take their children to the doctor daily?

It is also true that there has been in the past so much charlatanry practised by eye doctors, that the people of Egypt are not all by any means ready to take a well-qualified surgeon at his own valuation, or to follow his uncorroborated advice, which usually, of course, means the disbursement of money to him for operation or treatment.

It should also be remarked as regards the class of patient which in this country seeks relief at the Government hospitals, that it is certain that the hospitals would be absolutely swamped and general clinical and public health work disorganized if even those patients alone sought treatment who were in need of operation to prevent immediate depreciation of vision.

The establishment by Sir Ernest Cassel of the Ophthalmic Hospitals, and their extension by the Public Health Department of the Egyptian Government, has made a start in the ophthalmic campaign which I do not doubt must be waged for centuries before the worst of the actual causes of ophthalmia have been removed, and for decades before existing suffering has been relieved. Even at the ophthalmic hospitals, at each of which clinical work is carried on for five and a half hours *per diem* by two or more ophthalmic surgeons assisted by a large trained subordinate staff, only 30 per cent. of the applicants can be treated sufficiently.

Certain conclusions may be deduced from a knowledge of the general ophthalmic condition of the country, which are as follows: (a) In a very large number of cases boys suffering from trachoma at Government schools are unable to obtain treatment out of school as the result of inability or unwillingness of their parents to pay for treatment, and frequently on account of lack of well-qualified surgeons. (b) The importance of training ophthalmic surgeons, as is now being done, who will later be attached to ophthalmic hospitals in various parts of Egypt for the service of the poor, and will also be at the service of the better-off inhabitants for private consultation. (c) The importance of providing, as soon as possible, the services of a skilled ophthalmic surgeon at each large school in the country.

It must, however, be borne in mind that it is even less possible to provide ophthalmic surgeons at once for every school than it is to provide money to pay for them, and that treatment carelessly or inefficiently applied does much more harm than good.

N.B.—At the primary schools the pupils usually remain four years, hence my reference in the next chapter to the four school years.

(To be concluded.)

CLINICAL MEMORANDA.

A NOTE ON THE SEASONAL PREVALENCE OF ACUTE GLAUCOMA.*

BY

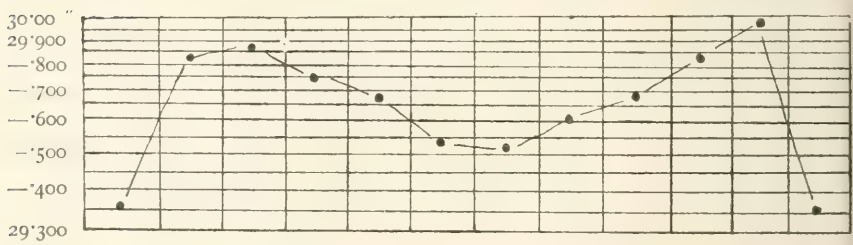
LT.-COL. F. P. MAYNARD, F.R.C.S., I.M.S.,

CALCUTTA, INDIA.

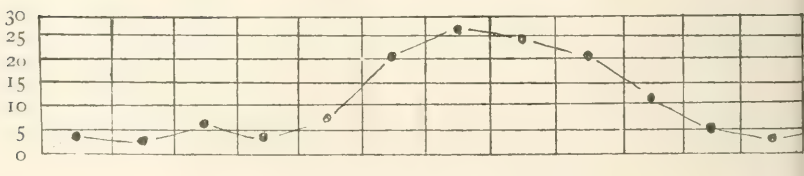
IT having been noticed that more cases of glaucoma are under treatment during the rainy season each year in the Calcutta Eye Infirmary, the figures were collected, and the attached chart was prepared for the six years, 1901 to 1906. Mr. Peake, Superintendent of the Meteorological Observatory at Alipore, Calcutta, kindly supplied the meteorological data.

The largest number of admissions are in July each year, in which month the highest rainfall and largest number of cloudy days are reached. The barometric pressure is low then, after falling steadily from March on, to rise steadily again till November, while December and January present the lowest readings in the year. The barometric pressure, therefore, does not seem to be connected with the occurrence of glaucoma

BAROMETER—AVERAGE OF SIX YEARS, 1901-1906.

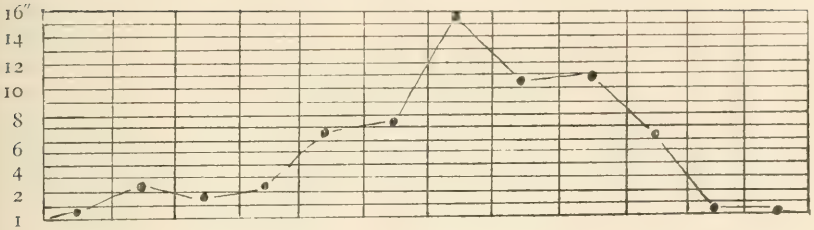


CLOUDY DAYS—AVERAGE NO. IN SIX YEARS.

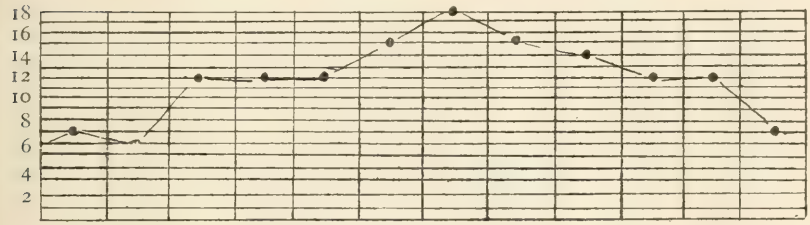


*Read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, July 31, 1908.

RAINFALL—AVERAGE OF SIX YEARS.



GLAUCOMA CASES ADMITTED—TOTAL OF SIX YEARS.



cases. Social customs can hardly account for the variations, as the subjects of acute glaucoma are in too great pain to allow them to weigh for or against coming to hospital. The only seasonal factor which may have some influence appears to be the amount of light. After months of brilliant sunshine the monsoon bursts in the second or third week of June usually, and the skies are cloudy from then on until October or even November. This change in the amount of sunlight is very striking and may possibly, by lessened contraction of the pupil, bring on an attack of glaucoma in those predisposed to it. The objection that as attacks of glaucoma are relieved at night, light can therefore have little to do with them, is met by the explanation that the attacks are really relieved by sleep during which the pupils are contracted. The objection becomes rather an argument in favour of the theory. The main difficulty consists in the rise in admissions occurring before the monsoon, *viz.*, in March, and of this no explanation has appeared. The figures are not large, but, as far as they go, they justify the collection of further evidence as to the truth or otherwise of the theory advanced. Mr. J. Herbert Parsons believes that there is a season for glaucoma in London in the winter. Anyone acquainted with the winter fogs in London, would be prepared if this be so, to regard the diminution of light as a possible, if not a probable, factor.

A CASE OF PERSISTENT CAPSULO-PUPILLARY MEMBRANE IN BOTH EYES.

BY

A. YALE MASSEY, B.A., M.D.

SAINT JOHN'S, NEWFOUNDLAND.

Muriel T——, 11 years, first seen by me May 26 last.

Family history.—Father, mother, several brothers and sisters, all have good eyes. No history of deformity in the family.

Personal history.—Has always complained of defective vision, and at times, of the eyes being sore and red.

Present state.—A well-developed, bright, intelligent girl, although very short in stature for her age, 11 years. There is no squint. The lids of the left eye are slightly red and swollen. The eyes are very noticeably small. The corneæ measure about 9 mm. in transverse diameter; the palpebral fissures are partially closed,

as in mild photophobia. The child complained that the strong light hurt her eyes. Movements of the eyeballs were good. Has never worn glasses.

R. V. = $\frac{6}{36}$, not improved by any glass. L. V. counts fingers at 2 feet: no improvement with a glass. With the pupils undilated, threads of persistent membrane hang in festoons from the anterior surface of each iris, taking their origin a short distance from the margin of the pupil and finding their insertion into the capsule of the lens, forming a *plaque* which gives a slightly frosted appearance to the lens, but unpigmented. This frosted condition was much more marked in the left eye than in the right, and the fibres also seemed larger in the more defective eye. On dilatation of the pupils, the fibres became taut. The fibres appear to be equally distributed over the pupils, as shown in the drawing of the left eye. The interior of the right eye was apparently normal;

the left was so indistinct that nothing could be definitely seen. The taut threads gave the appearance of turning the pupillary margin backward, something after the fashion of so-called *iris bombé*.

A NEW SCOTOMETER: TOGETHER WITH THE DESCRIPTION OF A CASE WHERE IT WAS FOUND OF SERVICE.

BY

PERCY C. BARDSLEY, M.A., M.B., B.C.,

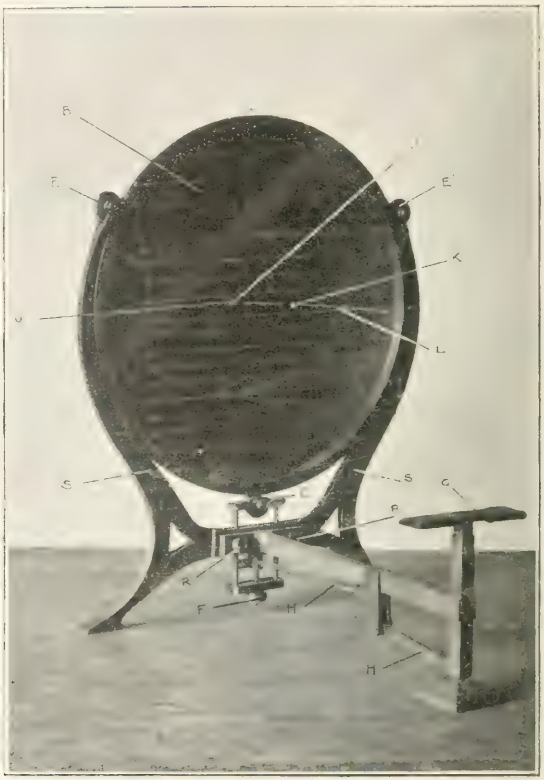
OPHTHALMIC SURGEON TO THE WILLESDEN HOSPITAL; CHIEF CLINICAL ASSISTANT TO THE ROYAL LONDON OPHTHALMIC HOSPITAL (MOORFIELDS).

WHEN in glaucoma a patient comes with one eye severely damaged or totally lost, the surgeon's chief concern, after doing what he can for the damaged eye, is as to whether the disease has started in the other eye or not. On examination, there may not be any tension, any cupping or flattening of the disc, or any obvious dimness of vision. If now the patient is sent away in happy confidence, he probably will not return until a very large amount of the field of vision is irretrievably lost, or even the macular fibres are affected. Is there, then, any sign other than the above by which incipient glaucoma may be detected? One of the earliest results of glaucomatous pressure is the enlargement of Mariotte's blind spot and the formation of an island or ring scotoma between the 10th and 30th degrees of the visual field.

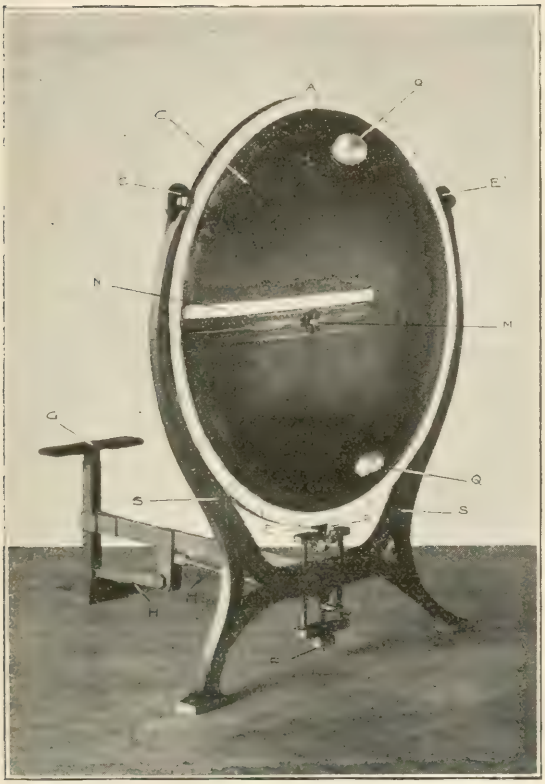
Now, the detection of these negative scotomata with the ordinary perimeter is difficult and inexact; but with the instrument about to be described, and with a patient of ordinary intelligence, their discovery becomes a comparatively simple matter.

The following are the details of the instrument shown in the accompanying figures:—1. The patient gazes into the dull-blacked section of a hollow sphere—a miniature Bjerrum's screen, with a central fixation disc. 2. There is not anything moving besides the test object; no carrier to reflect the light or to make a noise; nothing, in a word, to distract the patient's attention. 3. The surgeon sits behind the sphere, and is hidden away from the patient. 4. In the fixation spot of the spherical section there is a minute hole, through which the surgeon can watch the eye of his patient continuously, and can immediately allow for the slightest deflection on the patient's part.

This scotometer is of use in many other classes of disease besides the glaucomatous. The instrument is made by E. B. Meyrowitz, of 1a, Old Bond Street, London, W.



A. The section of a hollow sphere.
B. Dull-blacked concave surface of same.
C. Posterior convex surface of same.
E. E^1. E^2. Small wheels on which spherical section rotates.
F. Milled nut for raising or lowering E.
G. Chin rest, raised by—
H. Rod and pivoted cranked bracket.
I. Fixation disc, 6 mm. in size.
J. Small central hole for surgeon to look through.
K. Disc of variable size and colour sliding in
L. Very fine slot.
M. Carrier knob for disc from back of sphere.
N. Scale of degrees (radial).
O. Scale of degrees (circumferential).
P. Index hand for marking O.
Q. Knobs for rotating A.
R. Milled nuts for taking stand apart for packing.
S. Lyre-shaped stand for supporting rotating section.



(For lettering, see p. 868.)

The following case is instructive :—

Mrs. H., age 35 years, came to me on July 17th, 1907, complaining of eyes aching after reading and sewing, especially the right one. Her correction was :—

R. $\frac{+0{\cdot}5 \text{ D. sph.}}{+0{\cdot}5 \text{ D. cyl. } 15^{\circ} \text{ d.r.o.}} = \frac{6}{9}$. **L.** $\frac{+0{\cdot}5 \text{ D. sph.}}{+0{\cdot}5 \text{ D. cyl. } 15^{\circ} \text{ d.r.o.}} = \frac{6}{6}$.

Ophthalmoscopically.—R.E. : A patch of old choroiditis, about $\frac{3}{4}$ size of disc, on nasal side of disc with reticulated pigment over it. Guttate retinitis all over fundus, especially on nasal side of disc—several spots have coalesced at fovea to form an oval—some œdema of retina over macular region. Arteries bright, irregular, and tortuous. The disc is slightly paler than the left and is of post-neuritic type. L. E. : Vascular changes as in right. A few spots scattered about retina.

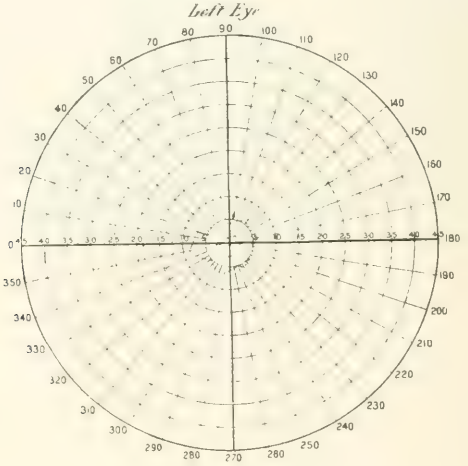
Urine normal. Pulse small and of high tension.

Under treatment, the vision of patient's right eye improved to $\frac{6}{6}$ and the eyes remained fairly comfortable until about

December, on the 31st of which month the patient came complaining that she had to give up reading, on account of mistiness and pain in left eye. Right pupil reacts to light, but contraction is maintained for a few seconds only. The pupil then slowly dilates, with large oscillations. Left pupil reacts to light, but dilates as right but more slowly. R. V. = $\frac{6}{6}$ badly. L. V. = $\frac{6}{6}$ well.

Ophthalmoscopically.—Right eye very much as on July 17th except that the guttate retinitis is not nearly so marked, and there is no visible œdema of macula. Left eye.—There is nothing pathological to be made out with the exception of the somewhat degenerated condition of the arteries, and a few very fine retinal changes at the periphery.

The fields were carefully taken on three occasions by my scotometer, with the same result on each occasion. They are shown opposite on Priestley Smith's chart. In the right chart. —The thick line shows a complete scotoma for 2 mm. white, extending from Mariotte's spot, embracing the patch of old choroiditis mentioned above, and also a large area which does not show any ophthalmoscopic change. Attention is directed



to the contracted field for 2 mm. green, shown by the dotted line.

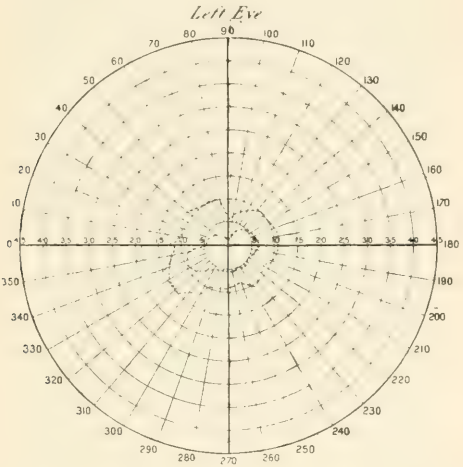
As regards the left chart.—The inner dotted line marks the area for fixed green 2 mm. The outer line the area of variable green ; the space between is a relative green scotoma, *i.e.*, the conduction of the fibres is in some way impaired and they quickly tire. N.B.—The normal field for 2 mm. green is a regular oval, slightly outside the 10th degree.

In the lower charts similar relative scotoma for red are shown.

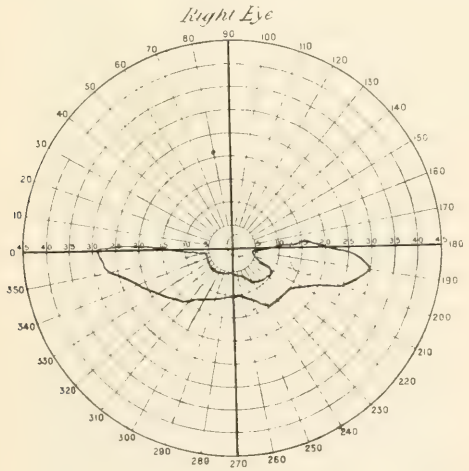
It is essential to remember that in the left eye there is no deviation from the normal to be made out anywhere near the fovea by the ophthalmoscope.

All the patient's reflexes are exaggerated. Her plantar reflexes are flexor. Her urine was frequently and carefully examined and was always found to be normal.

At this time I took her to see Mr. R. Marcus Gunn and Mr. J. B. Lawford. It was suggested that there was some deep

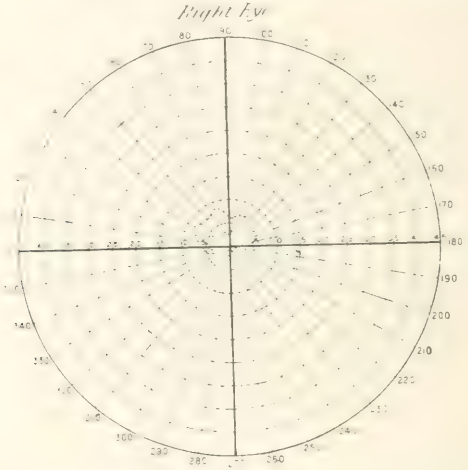


toxæmia poisoning her nerve-centres. A very thorough general examination was made without much result, but the following history was elicited.—For two years or more, she has suffered from almost constant attacks of neuralgia over varying parts of the body. Her skin has become somewhat dark and sallow.



More than a year ago, she was examined *per vaginam*, and an enlarged tube was found on her left side. A question of operation was raised, but she declined, as the condition caused her no inconvenience. She thinks she is now pregnant.

The subsequent events in the life of this patient may be briefly told. *January 30th*, 1908.—Patient has miscarried at three months. Doing well. *March 6th*, 1908.—After perfect recovery from the miscarriage, patient went down to Margate. She was to-day seized with rigors. Temp. 104°F. *March 10th*, 1908.—Laparotomy performed. Left inflamed Fallopian tube



removed. Left broad ligament involved and attached to left psoas muscle. *March 12th*, 1908.—Patient collapsed suddenly. *Exitus lethalis.*

Post-Mortem Examination.—Left psoas sheath full of pus. Left ureter bound down to psoas and full of pus. Left kidney healthy, but with pus in the pelvis, risen up from below. Pus in bladder and up right ureter about half-way. The tube was sent for examination and cultures of streptococci and staphylococci were grown from it.

Conclusion.—It seems that Mrs. H——had been suffering from chronic hydrosalpinx. This toxæmia had affected her vessels, her nerve-centres, and her retinal fibres.

NOVELTIES.

A BI-MANUAL OPHTHALMOSCOPE.

By

HERBERT TANNER, F.R.C.S.

THE number and variety of ophthalmoscopes is great and varied, but I make no apology for introducing another, since I believe the bi-manual method of using the instrument to be

new, as also the fact that in using it the operator has actual contact with the patient, which contact tends to steady the instrument, the observer, and the observed.

In examining the right eye, the light being arranged in the

usual position—but in a line with the eye—the upper hook is placed over the middle phalanx of the ring finger of the left hand (or, if a prominent forehead, on the little finger) the edge of the little finger resting on the forehead of the patient, the

lower hook is placed round the middle finger of the right hand the instrument is held steadily, vertically by a slight pull strain between the hands. The right forearm should be held almost

horizontal to avoid putting it in the path of the light rays. The instrument can be placed *in situ* if desired, and the operator's eye then brought to it.

The upper wheel of lenses is operated directly by the palmar surface of the thumb; the lower smaller one (containing emergency lenses) is rotated to required position before bringing up to the eye.

To examine the left eye the hands are reversed.

The larger wheel contains 8 minus and 7 plus lenses, the lower is a ·5 and 16 each concave and convex. There is thus a possibility of over 60 combinations, surely enough for every purpose. The lower handle is made long so that the operator's hand may be below the mouth of himself and that of his patient.

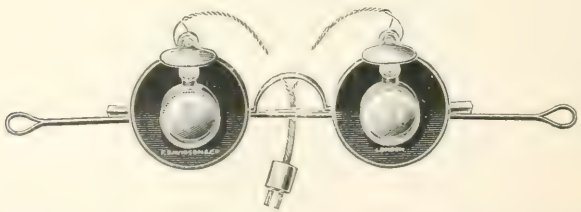
I venture to say that with this instrument any practitioner, with very little practice, can see the fundus. A young friend of mine who had never seen any ophthalmoscope before, asked to be allowed to use it, and looking through an undilated pupil he at once began to ask me what "that sort of full moon" was, and if those worms were bloodvessels.

The instrument has been worked out for me by Messrs. Down Bros., in their well-known careful and thorough manner, and they have also ingeniously adapted an electric light to it. I should like to mention that I have only a "parental" interest in the instrument's future.

706, Fulham Road,
Hurlingham, S.W.

PLATYSCOPIC SPECTACLES FOR THE PARTIALLY BLIND.

The appended figure illustrates Davidson's platyscopic spectacle, with electric attachment, as suggested by Mr. Robert W. Doyne, for the purpose of rendering help to those whose sight is very defective. The frame is glazed with achromatic lenses



magnifying 6, 10, or 15 diameters, mounted on either glass or metal discs. The lenses themselves consist of a central biconvex

lens of crown glass with two menisci of flint glass, fused one to the front and the other to the back surface of the first lens, thus producing an achromatic combination. The electric glow lamp, as shown by the figure, is fixed to the top of the glass or metal disc, as the case may be, and is actuated by a dry battery, an accumulator, or the house current, should such be available. Single and double platyscopic spectacles are made, but the latter should be preferred, unless one eye is totally blind, on account of the larger field it ensures.

This miniature microscope, for that is what it amounts to, will doubtless be found useful by those whose sight is seriously impaired—to such persons, in fact, who are unable to read even by the aid of a large magnifying glass held in the hand. Although print must be held close to the eyes with the platyscopic spectacles, yet, owing to the achromatism of the lenses, it is claimed that no fatigue is experienced if the frame is correctly centred.

The double platyscopic spectacles cost £3 5s., or with electric attachment, £4 5s. They are to be obtained from the makers, Messrs. F. Davidson & Co., 29, Great Portland Street London, W.

REVIEW.

SOME OF THE NEWER OPERATIONS UPON THE EYE AND ITS APPENDAGES.

BY

HAROLD GRIMSDALE, M.B., B.C., F.R.C.S.,

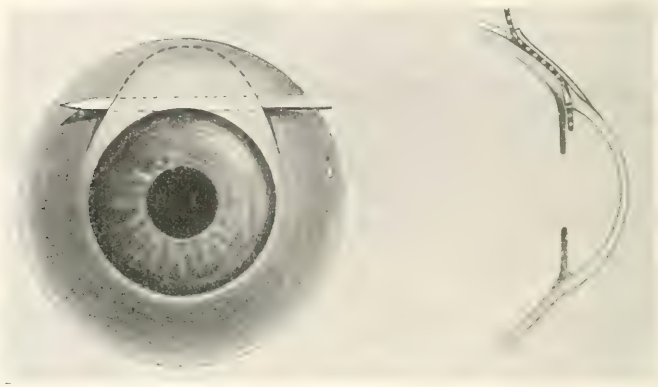
OPHTHALMIC SURGEON TO ST. GEORGE'S HOSPITAL, LONDON, AND SURGEON TO THE ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, LONDON.

THE last two years have witnessed the introduction of several new surgical methods, more especially in the treatment of glaucoma and of cataract. It is the object of the present review to describe these new procedures, and in doing so, the following order will be adopted:—1. Glaucoma; 2. Cataract; 3. Operations on the ocular muscles; 4. Operations on the eyelids; and 5. Miscellaneous procedures.

1. Glaucoma.

The relief of chronic glaucoma has been the subject of much research during the past two years. Not only have pathologists sought to unravel the difficulties which surround the alteration of intra-ocular tension (as recorded in these columns[1]), but surgeons also have endeavoured to solve the problem from the clinical side, by improving the operative treatment in establishing a filtering cicatrix.

It has been shown that a soundly-healed cicatrix in the sclera is no more permeable than normal tissue. The attempt has been made, therefore, to remove some of the thickness of the sclera,

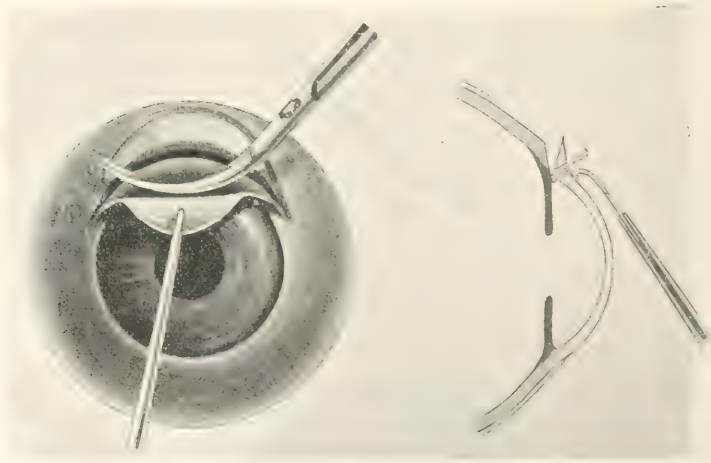


Lagrange's operation.

Fig. 1.—Section of the sclera and conjunctiva.

in the hope that the remaining parts, even after healing, will be permanently less resistent, and will thus allow of the more easy passage of the intra-ocular fluids.

Whether it suffices to remove some part of the thickness of the sclera alone, as is done by Bettremieux[2], or whether it is necessary

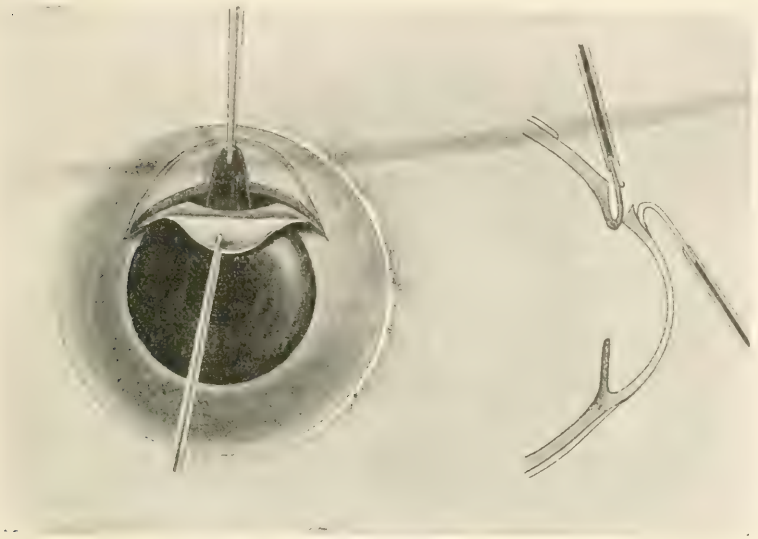


Lagrange's operation.

Fig. 2.—Resection of the sclerotic.

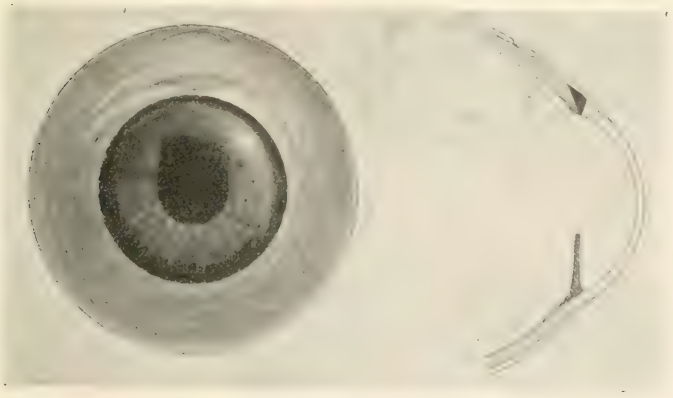
to open the anterior chamber, as Lagrange holds, can only be decided after a thorough trial of both methods. Lagrange

reasons that the outflow of aqueous will prevent the conjunctiva healing down hard on the wound and closing the gap with cicatricial tissue.



Lagrange's operation.
Fig. 3.—The making of the iridectomy.

Herbert[3] seeks to gain the same end by separating a fragment of scleral tissue from all its attachments, except that to the overlying conjunctiva, and at the same time opening the anterior chamber and making a small iridectomy.



Lagrange's operation.
Fig. 4.—The result of the operation.

The *technique* of these various procedures may be briefly described.

Lagrange[4] makes an incision as for sclerotomy, but directed rather more backwards than usual; before the knife emerges he turns the edge well back, and cuts a long conjunctival flap (fig. 1). This he turns over the cornea, dissecting it, if necessary, from the subjacent sclera, and then, with curved scissors excises the portion of sclerotic between the wound and the corneal margin (fig. 2). Lastly, an iridectomy is performed (fig. 3). There is left, therefore, a weak place in the capsule of the eye, which never becomes so dense as the normal sclerotic, and allows an abnormal escape of fluid. On the other hand, the escape is not so free as after an iridectomy with entanglement of iris in the wound, and the formation of a cystoid cicatrix. Lagrange draws a distinction between his filtering and a cystoid cicatrix. The latter is frequently associated with hypotension.

Herbert's method of operation is a little difficult to follow, and in Maynard's book, where it is described, one of the diagrams has been apparently rotated through some thirty degrees, thus making the difficulty greater (*v.* Fig. 20, p. 47). The incisions are made as follows: an incomplete sclerotomy is made with an opening of the anterior chamber only about 3 mm. long. No cutting is done after the puncture and counterpuncture. The knife is then turned in the wound and the incision enlarged downwards until the whole breadth of the blade is visible in the anterior chamber. Then the blade is again rotated and the upward incision is completed through the sclerotic, without dividing the conjunctiva, which is kept out of the way by the escaping aqueous. Finally, the knife is pushed down to the bottom of the wound and the edge turned forwards; by an incision made with the blade in this position the lower edge of the scleral fragment is separated. After this, a small, "basal, buttonhole" iridectomy is made.

The incisions seem rather complicated, and the repeated turning of the knife in the wound would be likely to scratch the tissues and also to spoil the edge of the knife.

Herbert states that the separated piece of sclera will shrink and allow filtering, without completely closing the wound.

Bettremieux[2] describes his operation as follows: he dissects up a conjunctival flap over the region of the field of operation in the sclerotic, either towards the cornea, or in the opposite direction. He next traverses the superficial layers of the sclerotic with a slightly curved needle, in a line tangential to the border of the cornea, and then excises the overlying scleral tissue by repeated cuts of a narrow linear knife. In this procedure he follows the method devised by Parinaud for posterior sclerectomy.

It is clear that if this procedure be sufficient to establish a filtering cicatrix and permanently to lower the increased tension, it has great advantages. In many cases—for example,

where as a result of iridectomy the other eye has been lost from hæmorrhage—the surgeon is loath to open the anterior

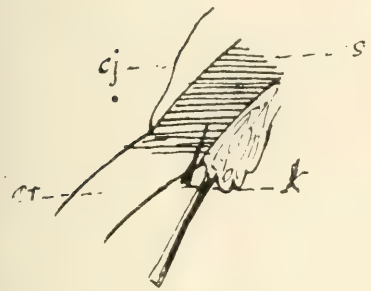


Fig. 5.

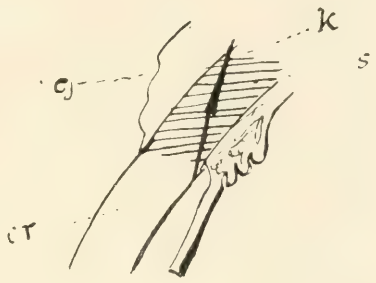


Fig. 7.

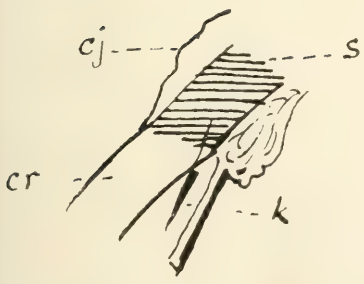


Fig. 6.

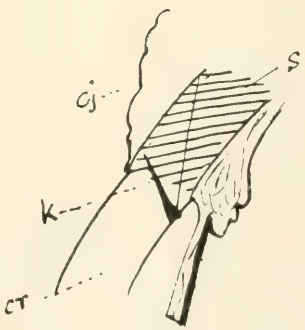


Fig. 8.

Diagrams to show the various stages of Herbert's incisions, cj., conjunctiva ; cr., cornea ; k., knife ; s., sclerotic.

In Fig. 5, the first stage of the first incision is shown, the knife with the edge upwards, has just opened the anterior chamber.

In Fig. 6, the second part of the first incision is shown ; the knife has been rotated in the wound until the edge points downwards, and the incision has been prolonged downwards until the whole of the blade is visible in the anterior chamber.

In Fig 7, the knife has been again rotated and the first incision completed by upward cutting ; the edge is emerging through the sclerotic under the conjunctiva.

In Fig. 8, the second incision is being made ; the knife, pressed down to the bottom of the wound, has been rotated forward, and a second incision begun in front of the first, starting from the lower part of this, and inclined forward.

chamber, and would look with the greatest satisfaction on any method which allowed him to achieve his end without this, but, theoretically at least, the power of the Bettremieux operation to lower tension seems very doubtful; there is nothing to prevent complete cicatrisation of the wound, and it has been shown that a cicatrised wound remains permeable only for a limited time. Finally, Bettremieux's records do not extend long enough to answer the question whether his results are permanent.

On the other hand, we have all seen the permanent results which follow the formation of a cicatrix with œdematous conjunctiva, the filtering cicatrix desired and often attained by Lagrange. We are therefore in a better position to appreciate the possibilities of his method, which has, moreover, been shown by comparatively lengthened experience to have the qualities claimed for it.

Lagrange's method would seem to be, at present, the best means of combating the increased tension of chronic glaucoma. Herbert's operation, on the contrary, is neither so simple nor so efficacious, since the fragment of separated sclera would seem capable, in certain circumstances, of regaining its attachment to its original bed, and thus of reducing the wound to the condition of a double sclerotomy.

Weekers[5] has recently published an article in which he relates the results obtained by Axenfeld in five cases of chronic glaucoma, which were treated after the method of Heine—that is to say, by cyclodialysis. The operation was in all respects that originally described. The results were, for the most part, disappointing. The tension fell only to rise again.

Holth[6] has tried to regularise the entanglement of iris in the wound of iridectomy, with the view to establish a leaking cicatrix. The risks of these wounds are well-recognised, and although Holth tries to minimise them by making a long subconjunctival passage, they cannot be entirely overlooked. The presence of prolapse is never desirable, and the operation has little chance of favour while the method of Lagrange offers equal filtration with less risk.

2. Cataract.

Until the publication of the third edition of Major Herbert's book[7] a few weeks ago, little had been written on the subject of cataract operation.

Smith's success in intracapsular expression has induced a few surgeons here and in America to attempt the same method; he has been followed by many Indian surgeons.

Generally speaking, the comments have been unfavourable, except from Indian surgeons, and they are not unanimous. Maynard, in his *Manual of Ophthalmic Operations*[8], is distinctly

averse to the procedure as a routine operation, and Herbert's opinion[7] is similar.

Cheney and Greene in America are not impressed with the results, and although Standish is more inclined to view the method with favour, the number of cases is too small to build upon.

It may be taken as granted that the chief advantage claimed for intracapsular expression is the complete removal of the capsule. This, however, does not do away with all chance of after-cataract; and, on the other hand, the risk of dealing with uncomplicated after-cataract is not great. The chief danger in intra-capsular expression is prolapse of vitreous, and although Smith has reduced the loss to 6 per cent., no other operator has been even approximately so successful. Indeed, many have recorded 30 per cent. of vitreous losses, and this will naturally counterbalance the advantage named. While, then, the method may fairly be tried in selected cases, *e.g.*, in Morgagnian cataracts, there is no doubt that it cannot be regarded as suitable for general ophthalmic practice in England.

The subject of operation in the face of known risk has been dealt with by Axenfeld[8] in a paper in the *Archivos de Oftalmologia Hispano-Americanos* for May, 1908. Here he professes himself in favour of reclination after a preliminary iridectomy. His method of reclination differs somewhat from that commonly described, and is called by him "Scleronyxis anterior." The needle, entering through the sclera, passes in front of the iris and up to the coloboma; here the flat of the

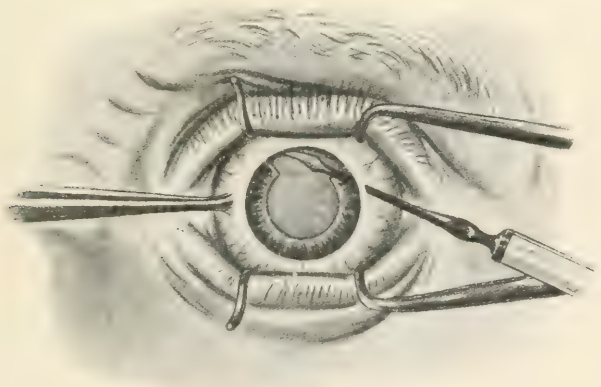


Fig. 9.

blade is applied to the edge of the lens, and this is depressed, without rupture of the capsule (fig. 9).

A very similar operation was performed by Bourgeois[9] some years ago. Axenfeld points out that complete dislocation is not necessary if an iridectomy be performed, since the edge of the lens need be depressed only a few millimetres to bring a free pupil into being. Hence, the iridectomy is done with a different aim from that of Bourgeois, who hoped thereby to guard against glaucoma.

This method of subluxation would seem to be much less objectionable than the ordinary reclination or depression, after which the lens was commonly a source of irritation to the ciliary body. The method might be of value in the insane.

The question of subconjunctival extraction in similar conditions has also excited some interest.

It seems very doubtful whether the method of Czermak has any very great advantage over an extraction with a long conjunctival flap. Instruments have to be introduced under the detached conjunctiva and into the wound ; they are bound to rub against the conjunctiva at the edge of the incision, and may carry pathogenic micro-organisms with them. The only way of escaping this risk would be some operation like that of Müller for detached retina, in which the primary incision is made in the skin, and this, together with the tarsal plates and conjunctiva, dissected back until the field of operation on the globe is visible.

Such a method for the extraction of cataract has, so far as I know, never been seriously proposed. The overlying flap would obscure the view to such extent that it would be almost impossible to place the incision accurately in the corneal margin, and to place it in the ciliary region would give rise to risks which would more than counter-balance the advantages of possible sterilisation.

On the other hand, a long conjunctival flap affords considerable protection against prolapse, and heals down within a very few hours, thus minimising the danger of secondary infection. Where it is necessary to protect the wound as much as possible, it may be wise to secure the flap in place by two or three fine sutures.

The ideal method of closing the operation-wound would be by the application of some cement, similar to collodion, but adhering to damp mucous membrane without irritating the eye. This material could be painted over the wound, thereby forming an immediate and aseptic dressing. No such substance is available at present, but it is surely not too much to hope that increase of chemcal knowledge may at some future time give the ophthalmic surgeon a dressing such as is suggested.

Valude[10] has recently recommended ophthalmic surgeons to deal with immature cataracts by removing the cortical matter left after an ordinary extraction through the re-opened wound, on or about the sixth or eighth day, by means of an aspirator. This procedure has, he says, no risk and does not mean "a

second operation," so alarming to many patients. Both these points seem a little doubtful to the reviewer.

3. Operations on the Ocular Muscles.

There has been little or no attempt during the period under review to alter the *technique* of the ordinary methods of operation on the extrinsic muscles of the eye, but there has appeared a suggestion which may have an important bearing on the subject of treatment of long-standing ocular paralyses, namely, to supplement the action of the defective muscle by another.

It will be remembered that Jackson attempted to replace the action of the paralysed superior oblique by an alteration of the superior rectus. Dransart[11] now suggests that in similar circumstances we should attach the tendon of the paralysed muscle to the belly of the inferior rectus, and describes a plan of procedure. He makes an incision just below the inner third of the upper orbital margin, which incision turns down vertically at the inner end, and runs to within a few millimeters of the superior canaliculus. It is easy to lay bare the superior oblique through the upper part of this incision; after drawing it from its surroundings by a squint hook, Dransart seizes it in forceps, and either divides it as far back as he thinks necessary, or tears it away from its posterior attachments. He then lays bare the tendon of the inferior rectus, and tunnels under the conjunctiva from the margin of this muscle to the region of the superior canaliculus, where he meets the first incision. Through this tunnel the tendon of the oblique is passed—care must be taken that it lies between the reflected part of the tendon and the orbital wall—and it is then fixed to the edge of inferior rectus, which was previously laid bare.

Dransart hopes that in this way the action of the superior oblique will be restored, since the two muscles always act in concert. The operation has not, so far as I know, been performed on the living subject—Dransart's case, which forms the text of his paper, had the torn tendon of the superior oblique stitched to the external rectus—but bearing in mind the success of Motais' operation for ptosis, and the partial if incomplete success attained by Dransart by the method which he now thinks inferior, it seems a justifiable attempt to improve a condition which is often very irksome to the patient.

Stevenson[12] describes a method of advancement which he claims to be the best "one stitch" operation. He points out that it is a great advantage to be able to tighten up all the muscle by means of one knot; it is almost impossible to equalise the tension on the various parts if two or more sutures have to be tied separately. He uses a single suture armed at each end with a curved needle, and smeared over with aseptic ointment immediately before use. After exposing the tendon

and grasping it in the advancement forceps, he passes one needle through the overlying tissues and the muscle at the junction of the middle and lower thirds, then under the muscle to the lower border and up to the surface

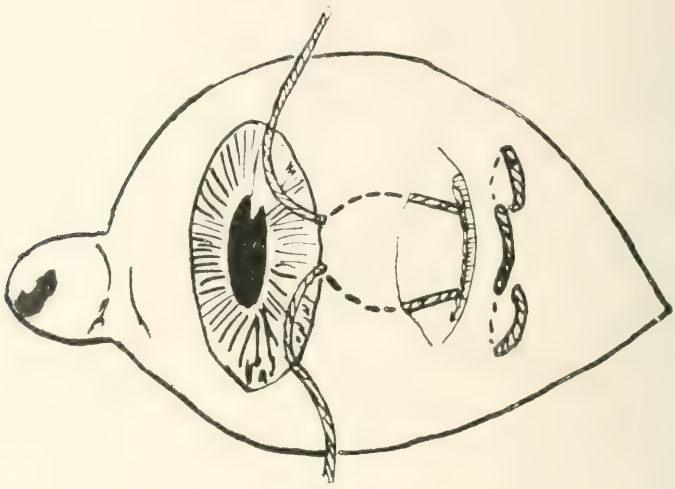


Fig. 10.

again; next, it again pierces all the tissues just behind its first point of entry, and then passes across the surface of the wound and under the conjunctiva to within a few millimeters of the cornea. Here it is made to tunnel through the superficial layers of the sclerotic, following a course which is a segment of a circle and approaching the horizontal diameter of the cornea. The other needle follows a similar course enclosing the upper third of the muscle and tunnelling the sclerotic, so that the two needles are close together at their points of emergence through the conjunctiva near the sclero-corneal junction (Fig. 10). He lays stress on the curved course in the sclerotic as less likely to cut out. The tying of the single knot brings the muscle up to the limbus.

J. E. Cogan[1] criticises, rather unfavourably, both this method and that of C. Worth. He thinks that both are likely to weaken the muscle which the operator desires to strengthen; he has therefore devised a stitch which forms an adjustable loop on the deep surface of the muscle, and combines this with Stevenson's scleral suture. Cogan has also attempted to avoid any perforation of the sclerotic by running the sutures round the cornea, and bringing them out on the side opposite to the muscle which is being advanced, where they are then tied.

4. Operations on the Eyelids.

In the period under review there have been few proposals

for operations on the lids. Ruggero Pardo[15] described during the XIX Italian Congress, at Parma, an operation for entropion which seems to be identical with that of W. Spencer Watson (*Trans. Ophthal. Society* U.K., Vol. XIV, 1894, p. 17). It consists in transposing the position of the lash-bearing zone of the lid and an island of skin above it. In those cases in which an ill-developed tarsal plate makes a turning operation, after the manner of Streatfeild, impossible, the Spencer Watson operation is often very valuable. It presents some advantages over the operation of van Millingen, in that the stiff tissue brought down to the lid margin, resists considerably any further in-turning. The chief disadvantage of the method is that the skin which forms the new lid edge remains downy skin, and the small hairs are liable to irritate the eye. I have found the procedure a successful one in a patient whose tarsal plate had been almost entirely removed by a previous operation.

Chailan[16] gives an account of the latest modification of Nicati's operation for entropion. Details follow: after everting the lid, he makes an incision through the conjunctiva parallel with the lid margin, at the point where the cicatricial changes commence, and dissects up the conjunctiva as far as the *cul-de-sac*. He then divides the tarsus by a horizontal cut through the angle of contraction, and frees its anterior surface from the orbicularis, laying it completely bare. He then passes the two ends of a loop of suture through the tendon of the levator and down in front of the tarsus, to come out near the edge of the lid. Two such loops are usually enough. Chailan speaks very favourably of this operation, which, he says, avoids the slight deformity which occasionally followed Nicati's earlier methods. It is rarely unsuccessful.

As will be seen, it has some resemblance to Panas's operation, and like this, has the slight disadvantage that it lays the cellular planes of the lid open to the invasion of bacteria from the conjunctival sac. Theoretically, this seems bad surgery, when it is possible to gain the same end by division of the front of the tarsus without wounding the conjunctiva.

Falchi has suggested[17] an operation for the relief of central colobomata of the lid, which, although somewhat complicated, appears to give good results. He first scarifies the edges of the upper and lower lids; then he refreshes the edges of the coloboma by two cuts (as in Fig. 11) which meet above; for these he uses a Graefe's knife or sharp strabismus scissors. Then a vertical incision is made from the external canthus for the whole height of the lid, and involving its whole thickness including the conjunctiva. Now he unites by suture the inner thirds of the borders of both lids and the adjacent edges of the coloboma; the outer third of the border of the upper lid is fixed to the middle portion of the lower lid.

When these parts are firmly sutured together, he makes an

incision a' through the skin, prolonging the line of the palpebral fissure for a length equal to the wanting part of the border of the upper lid, and a second incision running from the external end of the first (c) parallel with the raw edge of the skin, and ending about 3mm. from the eyebrow. The flap of skin marked out by these three incisions is freed from its deep attachments, and

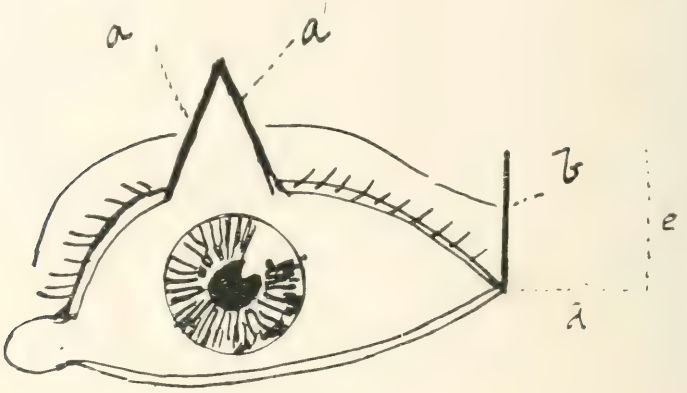


Fig. 11.

brought in to fill the gap in the upper lid left by the preceding steps. Finally, the raw triangular surface left after the sliding of this rectangular flap is filled by a graft taken from the arm.

Fergus [21] recommends an operation for ptosis in which a considerable portion of the skin of the upper eyelid, together with the underlying tissues, is resected. The remaining portion of the tissues is sutured to the strong fibrous tissue from the occipito-frontalis muscle, and the operation is completed by closing the skin wound with a few points of interrupted suture.

5. Miscellaneous Procedures.

Rollet [14] expresses his opinion that ophthalmic surgeons have become too eager to have recourse to Krönlein's operation in presence of any orbital tumour. He prefers, generally, to attempt removal by means of a large curved incision, placed over the chief prominence of the swelling. This, the old method of attack, has yielded in his hands, very favourable results.

Velez [18] has recently published accounts of several cases in which he implanted masses of subcutaneous fat, taken from the gluteal region of the patient, to improve the socket after excision or evisceration of the globe. This seems a better plan than that of Lagrange, who employs for this purpose the freshly

excised eye of a rabbit. It has been conclusively proved that tissues from another animal do not unite with the host on whom they are engrafted, but are gradually absorbed and replaced by developing connective tissue. On the other hand, a graft from the same individual has good chance of surviving. From personal experience, I am inclined to doubt whether these measures have any advantage over the operation devised by W. Adams Frost (implantation of a glass ball in Tenon's capsule). The glass globe is so easy to sterilise and so well retained, that it may well be questioned whether we are justified in making a second wound, however trivial, on the patient under our care, and certainly we are not justified, in my opinion at least, in mutilating an animal for a benefit which is at best problematical.

Okuneff [19] has recently brought forward a new method for the treatment of obstruction of the lacrymal duct, which will be noted with interest both by ophthalmologists and rhinologists. In those cases in which the obstruction is situated at the lower end of the naso-lacrymal canal, he removes the anterior third or half of the inferior turbinal, and then with cutting-forceps removes the inner wall of the bony canal containing the nasal duct, and the mucous membrane of the duct itself in the same extent. In this way he forms an open canal reaching almost to the lacrymal sac—one which therefore opens by a short duct into the middle meatus. The plan seems to offer good hope of relief in the cases where the obstruction is low down.

In similar cases, Lagrange and Aubaret [20] have revived the old method of perforation of the lacrymal bone, making a large passage opening directly into the nose. By laying down careful directions for its performance, they hope to improve the results; but the plan has failed in the hands of others, and without further details, the reviewer cannot regard it as hopeful.

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TRANSLATION.

THE SHARE OF THE OPHTHALMIC SURGEON IN THE OPERATIVE TREATMENT OF THE ACCESSORY SINUSES OF THE ORBIT.*

By Professor Th. Axenfeld.
Freiburg in Baden.

The articles and abstracts on the diseases of the accessory sinuses of the orbit, which appeared in the April number of The Ophthalmoscope, show very clearly that the subject is of universal interest to the ophthalmic surgeon, and the information given there is of the best. The same applies to the papers read by George Mackay and Logan Turner at the last annual meeting of the British Medical Association. In the following pages I propose to deal briefly with one aspect of the question, upon which opinions still differ.

In a recent paper, which is very well-worth reading, Birch-Hirschfeld† says that he cannot agree that the operative treatment of the accessory sinuses should become a field which ophthalmic surgeons should endeavour to make their own, more than has hitherto been the case. For it was not only a matter of acquiring skill in some mode of operating; it was quite as important to be able to determine the indications for the operation, and to this end it was necessary, not only to possess a wide experience, but also to be an expert in all intranasal procedures, and the latter were only at the command of the practised rhinologist. It was preferable, therefore, that the rhinologist should be left to determine the lines of treatment, as well as to perform the operation upon the accessory sinuses. The ophthalmic surgeon would still be there to assist in the diagnosis, or to deal with an orbital abscess, and thus remove a great danger to the eye.

*From *Klinische Monatsblätter für Augenheilkunde*, Mai, 1908. (Revised by Professor Axenfeld.)

†*Klin. Monatsbl. f. Augenheilk.*, 1908.

My views, which differ from those outlined above, have already been given in the discussion which followed Birch-Hirschfeld's paper at the Congress of Scientists and Medical Men in Dresden.* The question, however, involves a matter of principle, and for this reason I wish to take it up again and to discuss it more fully.

First of all, we absolutely agree with Birch-Hirschfeld that every case of orbital disease complicating an affection of the accessory sinuses requires an exact rhinological examination and statement of opinion. As a rule, there will be no difficulty in obtaining this from a specialist. If the latter is of opinion that endonasal treatment is necessary, and that such treatment will also remove the orbital symptoms, then no doubt every ophthalmic surgeon will leave the case to the rhinologist. Neuralgias, disturbances of vision, etc., without signs of orbital inflammation, are examples of this kind. Further, cases in which these symptoms are caused by catarrh and empyema of the sinuses requiring radical operation will in the majority of cases be referred to the rhinologist, who knows in which cases conservative and operative measures are indicated, and treats each of the latter upon individual lines. Sometimes, also, cases of slight orbital œdema will yield to intranasal treatment: I have seen, *e.g.*, a slight œdema of the orbit disappear rapidly after endonasal removal of some inflamed ethmoidal cells. Slight chronic ethmoidal ectasia, so-called mucocle, may also, in exceptional instances, disappear under endonasal treatment; v. Eicken and myself, treated a case of this kind a little while ago.

It is different, however, in cases of severe orbital inflammation, and in most of those, in which swelling leads to displacement of the globe; here, without exception, the orbit must be opened The prospects of intranasal or purely conservative treatment are too small; on the other hand, the danger to the eye and the adjacent cerebral tissues render access from the orbit necessary, while the exciting cause, the sinusitis, requires radical operation.† Even A. Kuttner, admits this unreservedly (*Berlin. klin. Wochenschrift*, 1908, *No.* 11), although in other ways he is more conservative than many rhinologists. It may be that we shall learn to become more conservative, but at present at any rate the radical operation is the one which is generally adopted in these cases; apart from this, the rhinological examination will supply additional information

*Reported in the *Klin. Monatsblätter f. Augenheilk.*, 1907, Bd. II.

†It is quite true that in cases of orbital or peri-orbital abscess following **acute** empyema of the frontal sinus, the latter condition may heal without radical operation (**Axenfeld**: *Deut. med. Wochenschrift*, 1906, p. 713). If in such cases the walls of the orbit are healthy and there is no direct communication with the orbital abscess, one should make a separate exploratory incision into the frontal sinus from the forehead, and be guided by the results. **Chronic** empyemas with grave orbital complications probably always require radical operation.

as to whether this operation is indicated in any particular case, and it will also tell us whether several sinuses are affected at the same time, *e.g.*, the frontal sinus together with the ethmoidal sinus. The mode of procedure, therefore, is quite simple in these cases, and when we know the sinus affected, undoubtedly the proper and most simple thing to do is to open the orbit and the sinus concerned at the same time. The same applies when the sinus is not detected by the rhinologist (and this does happen sometimes) or when it is discovered during the operation on the orbit. In so doing we follow the general principles of surgical practice and work in the best interests of the patient.

It seems to me, then, to follow from Birch-Hirschfeld's standpoint that the ophthalmic surgeon must either operate together with rhinologist, or one must follow the other at the operation, or we must transfer to the rhinologist the operations for laying open the orbit, as well as the accessory sinuses—in short, the whole of the surgical treatment of these cases.

Birch-Hirschfeld, however, does not draw this conclusion. On the contrary, at the end of his paper he says again that the evacuation of orbital pus is an important and gratifying province of the ophthalmic surgeon.

I go further than this. In my opinion, the ophthalmic surgeon ought to be able to obtain personal experience in the operative treatment of the exciting cause, *i.e.*, the affection of the sinuses, and his opportunities in this respect should be greater than they are at present in most of our ophthalmic hospitals. Such would also be in the general interest of ophthalmic surgery.

In my view, everyone who means to practise orbital surgery at all, and does not intend to leave it almost altogether to the surgeon, must be able to operate on the bones of the orbit, unless he wishes to limit himself entirely to cases which run their course in the soft parts only; and there are such cases, certainly. On the other hand, also, there are tumours of the orbit, which obviously involve the bony walls to such an extent (*e.g.*, the temporo-maxillary fossa or the superior maxilla) that the operation would exceed our range of operating under any circumstances. But who can be certain that the bones are not involved in cases which appear to be confined to the orbit, especially when they are more advanced? Who, again, will deny that there are cases which appear to be tumours, but which on operation turn out to be changes in the accessory sinuses? It simply does not do, as I have seen it done at many hospitals, and as one often finds reported in ophthalmic literature, to incise the orbit, or to perform exenteration, and if the bone is found to be involved, to proceed to use the cautery or the sharp spoon, but not to resect the bone wide of the disease, because the operation is beyond an ophthalmic surgeon; nor is it right to incise a supposed orbital cyst, and follow it up with a lengthy

treatment of a fistula, when the radical removal of an ethmoidal mucocele would have led to a rapid and complete cure.

We must be clear on this point. **Those who are not prepared to remove bone if necessary, must limit themselves very much in the operative treatment of orbital diseases.** If they like to do so, and hand over their orbital cases to the surgeon, they will not burden their consciences. But is this the practice of any ophthalmic surgeon or clinician, I should like to ask?

Few would care to go so far in giving up this interesting department of orbital tumours and inflammations, which, indeed, is most closely bound up with their speciality, ophthalmology. It forms, in any case, a borderland to which we too may lay claim, according to the degree of our operative skill. The ocular symptoms being the most disturbing, the bulk of these cases come to the ophthalmic surgeon. Again, it is we who are called upon to localize the condition and to ascertain the symptoms before and after. And I also think that the ophthalmic surgeon will be the man to deal most carefully with the organ whose delicate functions he appreciates and bears constantly in mind. For these reasons most ophthalmic surgeons probably operate on their orbital cases.

Further, the introduction of Krönlein's operation has already very largely modified the old view that the ophthalmic surgeon should confine his attentions to the soft parts. This resection of bone has been carried out by numerous ophthalmic surgeons in various hospitals. There is no doubt that to-day the number of cases operated on by the ophthalmic surgeon is much greater than that dealt with by the surgeon. In this connection it is worth mentioning that at the time of the Surgical Congress in Berlin, in 1905, the Council of the Chirurgical Society invited two ophthalmic surgeons—Helborn and myself—to read a paper on Krönlein's operation (see Langenbeck's *Archiv f. Chirurgie*). In the discussion which followed, Krönlein himself said that he had not had an opportunity of performing the operation again since his first operation, because the cases were dealt with by the ophthalmic surgeon.

From this to occasional surgical interference in affections of sinuses, especially of the frontal and ethmoidal sinuses—the roof of the maxilla does not often concern us—is but a step, and a consistent step.

It may happen, on the one hand, as I have seen, that at Krönlein's operation we come upon a retrobulbar abscess, whose seat of origin could not be determined before the operation, and find that it communicates with some deep-seated ethmoidal cells. The obvious thing to do under such circumstances is to prolong the incision inwards through the eyebrows and clear out the diseased cells. Again, in abcesses under the roof of the orbit—unless we leave all these cases to the surgeon, who, by the way, is not a rhinologist either—on making the incision through the

eyebrow, we may come upon an unexpected communication with a diseased fronal sinus, and then the latter should be cleared out at once.

On the other hand, the differential diagnosis between complications of the orbital sinuses and other possibilities is not by any means always certain. There are purely orbital cases which resemble them very closely, and there are others which start from the sinuses, and in which the rhinologist is not able to obtain any clear evidence of disease. The following are two cases in point :—

In a case which I operated upon recently, both I and my colleague, Professor Killian, had diagnosed mucocele of the frontal sinus or of one of the anterior ethmoidal cells, because underneath the roof of the orbit there was what seemed to be a typical, tense, elastic swelling. We could wash out the sinus from the nose, still everything else seemed so characteristic that we assumed that the process had started in a separate cell or in an encapsuled portion of the sinus. At the operation I found all the osseous parts and the walls of the sinuses healthy, but I discovered an **intraperiosteal encapsuled angioma,** which could be removed as a whole without injuring any of the soft parts.

Undoubtedly the ophthalmic surgeon was better equipped than a rhinologist to remove a tumour like this. The case was an interesting one, and will be published by Rupprecht in the *Klinische Monatsbl. f. Augenheilkunde.*

Another case :—

In a case of **an abscess under the roof of the left orbital cavity**, the rhinologist reported that the left frontal sinus showed nothing abnormal. Nevertheless, at the operation the roof of the orbit was found to be carious, and one could easily get into the frontal sinus. The latter was filled with mucous membrane undergoing polypoid degeneration and necrotic changes. It communicated with the frontal sinus of the other side, which was diseased in the same way, so that both sinuses were cleared out at the same time.

Still another case :—

A young man was **kicked by a horse, the blow being received over the right eye.** The superior orbital margin was fractured and the wound led into a very large frontal sinus. The upper lid was so deeply pressed into the wound, that it gave rise to lagophthalmos and a deep corneal ulcer, which soon perforated. The patient was sent to the eye hospital. Only an extensive **plastic operation on the conjunctiva** could save the eye ; the upper lid had to be brought back into position and the fragments of bone removed at the same time. The very large and deep **frontal sinus** was in a very serious and purulent condition, necessitating a **radical operation,** in which the orbital margin could not be saved and Kuhnt's operation had to be performed.

Now this was certainly a rare combination of operations but probably the simplest way of dealing with them, and the one best calculated to save the eye, which was in great danger, was to leave the ophthalmic surgeon to put everything in order at the same time. This I did. The eye was saved with useful vision and good closure of the lids.

A fourth case :—

In a man, aged 45, exophthalmos began to develop gradually in the course of several weeks, without any marked inflammatory symptoms, but with rapid loss of vision. Ophthalmoscopic appearances negative. Hyperæsthesia and radiating pain in the region of the fifth nerve. Only slight ocular paresis. Intra-ocular muscles normal. A short time previously there had been catarrh of the ethmoidal sinuses, which, however, healed when the exophthalmos became more prominent. The other accessory sinuses were healthy. I thought of a tumour at the back of the orbit, or possibly some inflammatory process starting from the deepest walls of the orbit. Large doses of potassium iodide had no effect. On account of the increasing pain, and in order not to leave anything undone, I operated according to Krönlein's method. Deep down, on the outer side between the bone and the periosteum, I came upon some unhealthy granulations, and when the elevator got near the apex of the orbit, some pus welled up. I extended the cutaneous incision through the eye-brow as far as the root of the nose. The roof of the orbit, the inner wall, and the floor appeared to be healthy, but the posterior half of the outer wall was covered with granulations. After scraping them away from the bone and the periorbita a small **defect** became visible in the lesser wing of the sphenoid, situated **between the superior and inferior orbital fissures,** leading into the temporal fossa. After enlarging the opening, more pus and caseous granulations escaped. I now removed the external wall of the orbit with parts of the wing of the sphenoid, so that the wedge opened into carious defect and the exposed dura, which was covered with granulations.

The whole cavity formed by an **extradural abscess of the temporosphenoidal lobe** communicating with the orbital cavity was scraped and drained. Considerable improvement followed ; the previous epileptiform attacks disappeared, and the patient gained weight rapidly and is still well to-day. The glass drain has now been in for eight months.

The microscopic examination, however, shows that the case is **tuberculous,** so that perhaps the patient cannot be permanently cured, in spite of the improvement, and although the conditions of drainage are favourable. The contents of the orbital cavity were not damaged by the operation and the periorbita was not opened into. I think one may say that such a case is best operated on by a man who has an intimate knowledge of the orbit, and has repeatedly performed Krönlein's and other atypical operations. For these the ophthalmic surgeon has com-

paratively the best opportunities. He meets with these purely orbital cases—and as such the case presented itself—relatively more often than anybody else.

The operation, moreover, involved inspection and a critical examination of the walls of the sinuses from the orbit. In another, in many respects similar, purely orbital case of deep periosteal inflammation, due to the staphylococcus pyogenes aureus, I found the seat of origin in a deep ethmoidal cell, communicating with the sphenoidal sinus. After clearing out the ethmoidal cell through the incision in the eyebrow, the case healed with full vision and unimpaired movements of the eye.

I refrain from giving details of any more of my own cases of orbital tumours, in which some resection of bone or of a portion of a sinus alone enabled a complete and satisfactory operation. The nature of a few cases may be mentioned; they speak for themselves; a case of carcinoma of the lacrymal gland with involvement of bone; a case of epibulbar carcinoma, extending to the lower lid, the lacrymal bone, and the orbital margin; a case of metastatic carcinoma of the ocular muscles with extension to the lower and inner periosteum of the orbit.

It remains for me to point out that there are also surgical cases of the lacrymal sac, which necessitate operation on the neighbouring bones and cavities, so in tubercle of the lacrymal sac, and sometimes in fistula of the lacrymal sac, in which the ethmoid may be found to be diseased.

There is one aspect of the question to which I should also draw attention. In University towns and others, where there are representatives of the other branches of medicine, one may, I repeat, take up the position—not the best one, in my opinion—that all the larger orbital operations, as well as the sinus complications, should be transferred. In smaller towns, however, the ophthalmic surgeon will not always find such opportunities, so that for this reason, too, he should obtain some personal experience in this branch of surgery.

The position may be summed up as follows: **Those who wish to be qualified to practise orbital surgery within limits, which are not drawn too narrowly—as they are perfectly entitled to do—and wish to be equal to any situation that may arise, must also possess experience in the operative treatment of the accessory sinuses.** Panas has already recommended operations on the accessory sinuses, and so has Kuhnt in Germany. But I am not aware of any connected account of the question with reference to orbital surgery and there are still numerous eye clinics which have paid comparatively little or no attention to the matter. And yet I think it desirable when cases occur in which, after due consideration, an orbital operation seems necessary, they should be operated on in eye hospitals more frequently than has hitherto been the case, so that our assistants and fellow-workers may gain

an insight into, and an increasing interest in, the subject. Practising on the cadaver, and rhinological courses and lectures will enable them to increase their knowledge.

I feel sure that my colleagues who specialize in diseases of the nose will consider that the reasons which we have put forward entitle us to claim a share in the adjoining territory. After all, we are only concerned with the cases of orbital complications which come to us first; we are not contemplating any further conquests. The interest which we gain in the relations between the eye and the nose is sure to bring the rhinologist many cases from among our patients, a large number of whom require treatment for affections of all kinds of the nose and throat, as well as for changes in the accessory sinuses. Of course we welcome operations performed jointly by the ophthalmic surgeon and the rhinologist. I have learnt a great deal in my operations with my colleague Killian. But the ophthalmic surgeon should be able to deal with the walls of the sinuses himself.

As for the endonasal treatment of the other diseases of the nose which are so frequent among eye patients, I do not think the ophthalmic surgeon should undertake it as a rule. In America it is true, the two specialities are often combined, and for us also it is desirable that the ophthalmic surgeon should during his course of training devote some time to rhinology, X-ray photography, and transillumination, in order that he may learn to judge for himself and be properly equipped in case he should find himself alone in a smaller town or in circumstances in which special rhinological assistance is not available. When the latter is at his disposal, he will leave the special examination and treatment in these cases to the rhinologist, unless he practises nose and throat work also. PERCIVAL J. HAY.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—THE CEREBRAL AND OCULAR COMPLICATIONS OF ANÆMIA.

Hawthorne, C. O.—An address on the cerebral and ocular complications of anæmia, and the probable relationship of these to thrombosis. *Lancet*, September 19, 1908.

This is a well-written and closely-reasoned article, in which **Hawthorne** (London) sets out the argument in favour of intravascular clotting as a cause of admittedly rare complications of the anæmic state, *viz.*: cerebral symptoms, with various paralyses,

and often with double optic neuritis. Such symptoms suggest the diagnosis of intracranial tumour or meningitis; but there can be no doubt, in the opinion of the author, that most, if not all, of these cases are examples of venous thrombosis within the skull. Having shown that in some severe cases with fatal issue, nothing was found *post-mortem* to account for the symptoms except thrombosis in the cerebral veins and sinuses, and that in non-fatal cases with similar symptoms, the diagnosis of intracranial thrombosis has been sometimes supported by the development of thrombosis elsewhere, Hawthorne proceeds to the argument that since thrombosis is accompanied by optic neuritis as one symptom out of a number, such thrombosis is an efficient cause of optic neuritis. From this proposition we have the conclusion, that when optic neuritis occurs alone or associated with some ocular palsy in a case of anæmia which otherwise is following a normal course, thrombosis is probably the cause of the neuritis. So also, if hemiplegia may be due to intracranial venous thrombosis (a fact beyond dispute) then an ocular paralysis may have a similar cause when associated with optic neuritis. Further, "if optic neuritis and an ocular paralysis appearing together in a case of anæmia are to be attributed to intracranial thrombosis, is it not probable that when, under similar conditions either exists alone, thrombosis is again the responsible cause?" The author also argues that since intracranial thrombosis may be the cause of the optic neuritis and ocular paralysis which complicate middle ear disease (for *post-mortem* there may be no other cause for these symptoms), thrombosis is equally likely to be the cause of them in anæmia. He then proceeds to deal with objections to this theory of the cause of optic neuritis in anæmia, and summarises them thus: "Neither a difficulty in providing a manifest explanation of the mechanism by which sinus thrombosis may produce optic neuritis; nor the claim that the frequent absence of general cerebral disturbance with such neuritis opposes the diagnosis of intracranial thrombosis; nor the observation that in arterial thrombosis optic neuritis does not occur; nor the comment that the neuritis disappears under treatment by iron—is found, on examination, to present any insuperable objection to the proposition that optic neuritis occurring in anæmia has, in all probability, its explanation in the formation of blood-clot in the veins or sinuses of the brain." The author then discusses other hypotheses which have been advanced to explain the occasional existence of optic neuritis in anæmia. The possibility of attributing to thrombosis certain rare cases of alterations in the visual fields occurring as the only evidence of cerebral disturbance, is closely reasoned out from the histories of two patients. Finally, the author has something interesting to say about retrobulbar neuritis occurring in anæmia. Sudden loss of vision in one eye demands a lesion of the optic nerve behind the eyeball, and this lesion may be thrombosis.

"The unilateral ocular complications of anæmia range from a greater or less degree of papillitis without prejudice to vision, to a condition of complete loss of visual acuity with little or no ophthalmoscopic change. And between these two extremes there are intermediate cases, which show in varying proportions, as it were, some measure both of papillitis and of visual defect. Assuming thrombosis as responsible for these facts, it is readily conceivable that the several varieties and combinations may be determined by the particular site at which the formation of blood-clot takes place." Enough has been said to show that this is a most interesting and helpful article. It is written in a logical style, and with a clarity of diction that is not always found in medical writings. ERNEST THOMSON.

II.—VISUAL FIELDS IN PIGMENTARY RETINITIS.

Hepburn, Malcolm L.—The visual fields in pigmentary degeneration of the retina. *Transactions Ophthalmological Society U.K.*, Vol. XXVIII, Fasc. 3, 1908.

In this interesting article, which contains no less than twenty-three elaborately worked out charts of the visual fields, **Hepburn** (London) compares the varieties of fields met with in pigmentary degeneration of the retina, with the view of distinguishing clinically by this means the type which may be called "primary pigmentary degeneration" from that which is secondary to chronic choroiditis, a distinction not always easy to make from ophthalmoscopic examination. In order to avoid those difficulties in this class of investigation which are due to want of intelligence and patience on the part of the patient, the author has selected only those cases on whose evidence he could rely "after careful preparatory instruction." Again, recognising that where the rods and cones are not hopelessly damaged, the visual acuity depends greatly on the degree of illumination and the size of the test object, he has employed a 10 mm. white test object in good natural light and has not adopted the method of diminishing the illumination. The paper is so well summed up by the author under seven headings that these may be quoted in full.

"(1) The visual fields in pigmentary degeneration of the retina conform to a definite type according to whether the degeneration is primary as in retinitis pigmentosa, or secondary to chronic disease of the choroid.

"(2) The earliest manifestation in primary degeneration is the appearance of the ring scotoma, at first incomplete, corresponding to loss of function in the intermediary zone of the retina; and, afterwards, the different portions degenerate in a regular order, the fixation point being the last to disappear.

"(3) In chronic disease of the choroid the characteristic feature is the patchy nature of the scotomata, which are of all shapes and sizes, and are scattered indiscriminately all over the visual field; but under certain circumstances the type reverts to that found in the primary disease.

"(4) The cause of primary degeneration of the retina is obstruction to the blood-current in the chorio-capillaris (Gonin-Nettleship theory); and the maximum amount of defect is dependent not upon the number of pigmentary deposits, but upon the extent to which the vessels of the chorio-capillaris are affected.

"(5) The scotomatous patches occurring in chronic choroiditis are accounted for by the presence of small areas where the retina and choroid have become adherent as a result of old inflammatory changes. If, for any reason, the choroidal blood-vessels become involved, the field indicates the same characteristics as those met with in primary degeneration, in addition to the already existing defects.

"(6) Islands of vision scattered throughout the scotomata suggest that, in disease, the retinal circulation may sometimes take the place of the choroidal and produce some restoration of function in a previously blind area.

"(7) The prognosis in pigmentary retinal degeneration depends largely on the condition of the retinal vessels."

A bibliography which contains over seventy names is appended to the paper. ERNEST THOMSON.

III.—REGIONAL ANÆSTHESIA.

Löwenstein, Arnold.—On orbital anæsthesia. (Ueber regionäre Anæsthesie der Orbita.) *Klin. Monatsbl. f. Augenheilkunde*, Juni, 1908.

Löwenstein reports a new method of local anæsthesia for enucleation and similar operations on the eye. His aim is to reach the ciliary ganglion. A hypodermic needle, 5cm. long, is inserted between the globe and lateral orbital margin at a point slightly below the middle of the latter and is pushed forward along the bone a distance of $4\frac{1}{2}$cm. It is then moved lever-like, to make sure of its point not having been caught in the optic nerve or a blood-vessel. One cm. of a one per cent. cocain and adrenalin solution is injected. The anæsthesia is complete after two minutes. Only in cases of long standing inflammation is the sensibility of the conjunctiva not quite abolished, and thus an additional subconjunctival injection ($\frac{3}{4}$cm. of the same solution) becomes necessary. The method has proved successful in over thirty cases. C. MARKUS.

IV. — PHOTOGRAPHY OF THE FUNDUS OCULI.

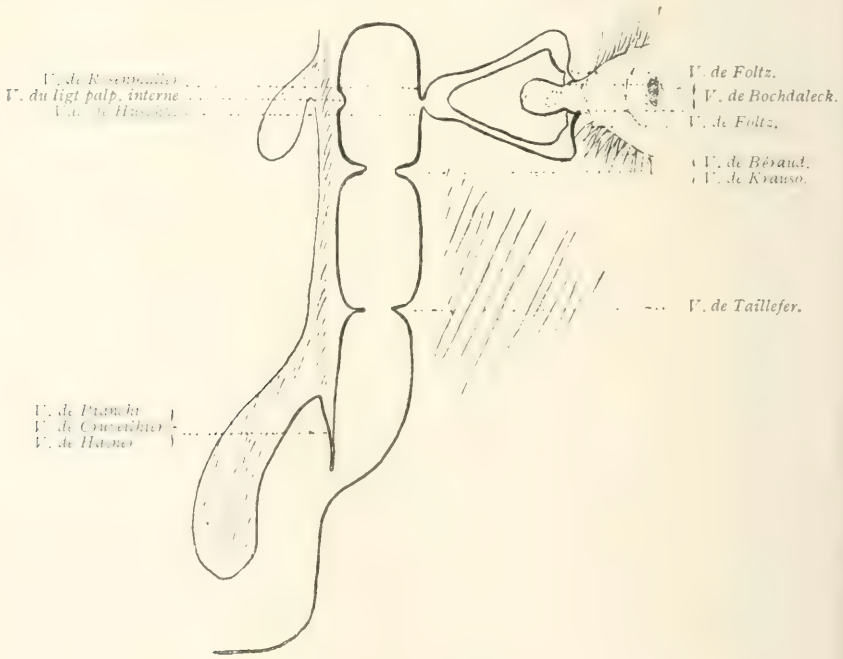
Wolff, Hugo.—Photography of the fundus. (Zur Photographie des menschlichen Augenhintergrundes.) *Arch. f. Augenheilkunde*, Bd. LIX. Heft 2, Februar, 1908, S. 115-142. Illust.

Wolff, in a highly technical paper, discusses the difficulties of taking a photograph of the fundus, and describes his method of overcoming them. The chief difficulty is represented by the reflexes which occur at the planes of contact between the various media of the eye. To eliminate these reflexes is a *sine qua non* for any success in fundus photography, and all attempts at obtaining a picture of the fundus mean so many efforts to overcome this disturbing element. Wolff describes the apparatus which he has designed for this purpose. He takes pains to emphasize that the construction of the apparatus is not the result of experiment, but that it is the product of theoretical considerations and preconceived ideas on the subject. To give an intelligible description of the details of the apparatus in a few lines would be impossible, but a few features may be mentioned. The photographic plate is practically in focus for any eye, and does not require adjustment of more than 1—2.5 mm., an accuracy which is not always necessary. All that the patient has to do is to look into the apparatus and fix some point of the image seen of the source of illumination. The latter is formed by the arc lamp of a Zeiss projection apparatus, and is seen through what is practically a microscope. The rays of light emitted from the arc lamp pass through the microscope-like arrangement, and are then reflected by means of a mirror, situate opposite the lower half of the pupil, into that half of the pupil, and in such a way, that the rays enter the eye parallel to its axis. In this way the reflexes are overcome, and the rays pass out of the eye through the upper half of the pupil into the photographic camera. The mirror is made of a special alloy, which allows of a very fine edge being given to it, so that the rays which pass over it from the eye to the camera do not undergo any deflection, and no light is lost. For the purpose of focussing, a focussing eyepiece is supplied with the instrument. The area of the fundus which is illuminated is 10 mm. in diameter, *i.e.*, about the width of six discs. The exposure is less than $\frac{1}{30}$ sec. The magnification is about 3.5, and the size of the photographs about 35 mm. Photographs, examples of the author's results, accompany the paper. PERCIVAL J. HAY.

V.—THE VALVES OF THE LACRYMO-NASAL PASSAGES.

Aubaret.—The valvular folds of the canaliculi and of the lacrymo-nasal duct from the anatomical and physiological point of view. (Les replis valvulaires des canalicules et du conduit lacrymo-nasal, au point de vue anatomique et physiologique.) *Archives d'Ophtalmologie*, avril et juin, 1908.

Aubaret (Bordeaux) sets out by enquiring what justification the anatomists have for the names they have bestowed, with no illiberal hand, upon the various folds of mucous membrane supposed to be found in different parts of the lacrymo-nasal passages. The names are set forth in the following list, which will be rendered easier of comprehension if reference be made to the accompanying diagram :—



1. Lower valvular fold... ... { Bianchi's valve / Cruveilhier's valve / Hasner's valve }
2. Valvular folds of the middle segment of the canal. { Taillefer's valve }
3. Valvular folds of the upper end of the canal. { Béraud's valve / Krause's valve }

4. Valvular folds of the lacrymal sac. { Transverse fold of the internal palpebral ligament
5. Valvular folds of the saccular orifice of the lacrymal canaliculi. { Rosenmüller's valve / Huschke's valve
6. Valvular folds of the lacrymal canaliculi. { Foltz's valve / Bochdaleck's valve

Each of the folds enumerated above is taken turn by turn, and the opinions of anatomists, ancient and modern, quoted with regard to its structure and functions, to which Aubaret adds his own observations on the points at issue.

(1) The fold of mucous membrane at the lower orifice of the lacrymo-nasal canal was first described by Bianchi, despite the fact that it is generally spoken of as Hasner's valve. Controversy has ranged around its structure and its functions. Present day views regard it as a fold of mucous membrane, of which the arrangement is extremely variable, and to which the word "valve" can scarcely be applied with propriety. According to Rochon-Duvigneaud, imperforation of Bianchi's fold plays an important part in the causation of that common affection known as congenital dacryocystitis. Indeed, its obliteration may lead to the state of things described by Bochdaleck as *Endblase*—that is to say, an infundibuliform projection of the mucous membrane, extending, it may be, to the floor of the nasal fossa. Aubaret's personal investigations lead him to conclude that the function of the mucous fold is to prevent the reflux of air and of fluid from the nose towards the lacrymo-nasal canal, provided its structure is adequate to that end, which is by no means always the case.

(2) The nasal canal shows several mucous folds, and to one of these, which is found about the middle segment of the canal, the name of Taillefer's valve was applied by Beraud. The valve, however, is rarely present (6 per cent.), and varies much as regards both its situation and its development. Sometimes its size is enormous. Rochon-Duvigneaud believes that the fold is more pronounced in the newly-born child, and that it tends to disappear with advancing years. Duplication of the canal may be simulated in rare instances by fibro-mucous folds dividing this part of the canal into two portions.

(3) Valvular folds at the junction of the lacrymo-nasal canal and the lacrymal sac, known as Béraud's or Krause's valves, are variable as regards positions, size, and arrangement. Béraud believed that the fold or folds played the chief part in the production of tumor of the lacrymal sac. Bochdaleck saw the valve replaced by a veritable diaphragm, while Arlt met with such a diaphragm pierced by a hole. Such arrangements, however, are extremely uncommon.

(4) Aubaret terms the mucous membrane of the lacrymal sac of newly-born babies "utricular"—that is to say, divided into

irregular cavities by irregularities of the lining membrane. In adults most of these folds disappear, but one fold, in especial, may persist, situated at the level of the anterior wall and corresponding to the internal palpebral ligament. This fold may become very prominent in cases where, owing to a mechanical distension, the dimensions of the sac largely exceed those of the canal. It is to the existence of such folds that one must attribute biloculation of the cavity of the sac, such as described by Tartuferi.

(5) Valvular folds at the orifice of the lacrymal canaliculi, the so-called Rosenmüller's or Huschke's valve, are as irregular in their disposition as is the mode of entry of the canaliculi themselves into the lacrymal sac. The canaliculi may enter the sac :—1. by a single channel ; 2. as separate channels ; or 3. by a diverticulum sometimes known as Maïer's sinus.

(6) Folds may exist in the canaliculi themselves, but such arrangement is uncommon. Bochdaleck described a small circular valve at the orifice of the canaliculi.

Bert, who experimented upon bodies from the Lyons dissecting-room, by injecting coloured liquids into the nose, found that the fluid escaped from the lacrymal points three times only in eighteen observations. Anatomical inspection showed that in the positive cases, the orifice of the lower end of the lacrymal-nasal duct was voluminous, gaping, and provided with an insignificant circular fold of mucous membrane. In the negative cases the anatomical conditions were just the reverse. In one subject, a woman sixty years of age, it is interesting to note that the result of injection while negative on one side, was positive on the other. Direct injection into the canal invariably yielded a positive result, an observation which went to prove that the valves other than Hasner's were constantly insufficient. The conclusions from Bert's experiments were :—1. that ordinarily the inferior lacrymal valve (Hasner's), while it had nothing to do with the aspiration of tears, as supposed by Richet, prevented any reflux of fluid, smoke, or air from the meatus towards the lacrymal points ; and 2. that the other valves, Hasner's valve once passed, offered no further obstacle to the reflux of fluids or air.

Aubaret has repeated Bert's experiments, using for the purpose an improved apparatus, rough details of which follow : a number of glass tubes of different sizes, each fitted at its end with a dilatation resembling a tiny cupping-glass, were used to fit over the opening of the lacrymo-nasal duct in the inferior meatus of the nose. By means of a caoutchouc tube and a three-way tap, the glass tube was placed in connection with, 1. a manometer graduated in centimètres of mercury and 2. a rubber force-bulb. Aubaret found, as might be expected, that Hasner's valve might be either sufficient or insufficient for the purpose of preventing reflux. The physiological value of the valves, as he points out, depends exclusively upon their

anatomical disposition. In 90 per cent. of the subjects examined the valve was incompetent, while in only 4 per cent. was it really competent. The question remains open whether the incompetence is connected with an atrophic state of the mucous membrane, such as might perhaps exist in the adult or aged subjects upon whom the experiments were made.

The second part of Aubaret's communication, which in all occupies nearly fifty pages of the *Archives d'Ophtalmologie*, is mainly devoted to the recitation of cases and to proving that valvular insufficiency may often constitute an important syndrome capable of yielding information about the state of the lacrymo-nasal mucous membrane and also of the pituitary membrane.

Aubaret quotes cases from the literature of smokers who could cause smoke to escape from the puncta lacrymalia (Morgagni, Bianchi, Malgaigne); of escape of blood from the puncta in epistaxis (Arnal, Moure, Beausoleil, Claoué); of emphysema of the lacrymal sac (Rau, Richet, Paccioni, Motais). The author admits that a valvular insufficiency may exist without alteration in the lacrymal mucous membrane. He speaks of this condition as one of "physiological vavular insufficiency," and regards the act of blowing the nose as one of its chief causes. Manometric readings show a pressure of 15 centimetres of mercury during the act, and about half that pressure if the nose be cleansed simply by closing one nostril while blowing down the other.

Pathological valvular insufficiency is shown by anatomical changes in the lacrymal mucous membrane and often also by changes in the eye and nose. It may be simple or complete. In the former, air is arrested in a more or less distended lacrymal sac, whereas in the latter it issues from the puncta. The signs include more or less distension of the sac, which can be seen, felt, or heard when the patient raises the pressure in the nasal fossæ, and by such symptoms as a sensation of titillation or a rumbling noise in the parts, and by watering of the eye. The mucous membrane may be variously altered in these cases.

SYDNEY STEPHENSON.

VI.—BASEDOW'S DISEASE.

Ohlemann, M.—On Basedow's disease: Exophthalmic goitre. (Ueber Basedow'sche Krankheit.) *Wochenschrift für Therapie und Hygiene des Auges*, August 29, 1907.

In a somewhat discursive review of the monograph by Moebius on Basedow's disease which appeared the previous year **Ohlemann** relates some of his personal experiences in the treatment of the affection. These have some importance as it was on account of Graves's disease that he had to retire from practice. Like most authors, he cannot report favourably

on antithyroidin, the serum obtained from thyroidectomised sheep. Iodine compounds in small doses have been most useful. He employed a few drops of a 20 per cent. solution of potassium iodide several times daily and found that the pulse-rate, which for a month had been between 90 and 105 during rest, fell after three days to an average of 68 to 78 while resting or moving. The improvement continued four weeks and then was followed by a slight relapse with a pulse-rate of 86 to 96, which became increased to 120 as the result of a journey. A trial with antithyroidin was quite unsuccessful, but a second course of the iodide again brought an improvement. In primary cases iodide may produce at first a temporary congestion of the gland with increased symptoms before improvement occurs.

Ohlemann speaks strongly on the injustice of those writers who declare that iodine is useless in the treatment of Graves's disease except when syphilis has been the cause, a statement which he completely contradicts. In conclusion, while not objecting to the theory of hyperthyrea he urges more accurate researches into the pathological anatomy of the thyroid and the sympathetic. W. B. INGLIS POLLOCK.

VII.—CONGENITAL ANOMALIES.

(1) **Koerber, H.—Patterns and blood-vessels of the iris.** (Iriszeichnung und Irisgefässe.) *Zeitschr. f. Augenh.*, Februar, 1906.

(2) **Cosmettatos.—Colobomata at the entrance of the optic nerve.** (Colobomes à l'entrée du nerf optique.) *Ann. d'Oculistique*, T. CXXXV, p. 395, mai, 1906.

(3) **Augieras.—On an anomaly of development of the internal angle of the two eyes, and canthoplasty of that angle.** (Anomalie de développement de l'angle interne des deux yeux et canthoplastie de cet angle.) *L'Ophtalmologie Provinciale*, III, 56, juillet, 1906.

(4) **Müller, B.—795 cases of congenital amblyopia.** (Ueber 795 Fälle von kongenitaler Amblyopie.) *Zeitschrift für Augenheilkunde*, Januar, 1907.

(5) **Hoeve, J. van der.—Coloboma of the optic nerve, with normal vision.** (Colobom am Sehnerveneintritt mit normaler Sehschärfe.) *Arch. f. Augenh.*, Februar, 1907.

(6) **Bertozzi, A. — Congenital alterations of the choroid ciliary region, and iris.** *Annali di Ottalmologia*, Vol. XXXVI (1907), fasc. 6, 7, and 8, p. 391 to 550, with 11 figures.

(7) Giffo.—A case of anophthalmia. (Un cas d'anophtalmie.) *L'Ophtalmologie Provinciale*, T. IV, p. 12, avril, 1907.

(8) Verderame, Ph.—Bilateral congenital coloboma of the lens; subsequent dislocation of both lenses. (Ein Fall von doppelseitigem angeborenem Linsencolobom mit nachfolgender spontaner Luxation beider Linsen.) *Arch. f. Augenheilk.*, April, 1907.

(9) Nance, Willis O.—A case of supernumerary canaliculus. *Journal of Ophthalmology and Oto-Laryngology*, May, 1907.

(10) Isakowitz, J.—Coloboma of the lens; with remarks on a physiological method of determining whether the lens is properly centred. (Ein Fall von Linsendefect, nebst Bemerkungen ueber den physiologischen Nachweis der Linsencentrirung.) *Arch. f. Augenheilk.*, Juni, 1907, p. 291. Illust.

(11) Fejér, J.—Abnormal pigmentation of the optic disc. (Abnorme Pigmentation der Sehnervenpapille.) *Arch. f. Augenheilk.*, Oktober, 1907, p. 290, Illust.

(12) Noll, H.—A case of coloboma of the eye. (Zur Casuistik der Colobombildungen des Auges.) *Arch. f. Augenheilk.*, Oktober, 1907, p. 280. Illust.

(13) Reis, W. — Congenital filiform anchyloblepharon. (Ankyloblepharon filiforme adnatum.) *Arch. f. Augenheilk.*, Oktober, 1907, p. 283. Illustrated.

(14) Posey, William Campbell.—Congenital squint. *Journal American Medical Association*, October 26, 1907.

(15) Breuil.—A contribution to the study of posterior venæ vorticosæ. (Contribution à l'étude des veines vorticineuses postérieures.) *L'Ophtalmologie Provinciale*, T. IV, p. 116, novembre, 1907.

(16) Cosmettatos.—Three cases of microphthalmia. (Trois cas de microphtalmie.) *Ann. d'Oculistique*, T. CXXXIX, p. 96, février, 1908.

(17) Dupuy-Dutemps.—The ophthalmoscopic lesions in a case of amaurotic family idiocy. (Lesions ophtalmoscopiques dans un cas d'idiotie amaurotique familiale.) *Ann. d'Oculistique*, T. CXXXI, p. 84, février, 1908.

(18) Peters, A.—Blue discoloration of the eyeball due to thinning of the sclera as a congenital and hereditary anomaly. (Blaufärbung des Augapfels durch Verdünnung der Sklera als angeborene und erbliche Anomalie.) *Klin. Monatsbl. f. Augenheilkunde*, Februar, 1908.

(19) **Pyle, Walter L. — Microphthalmus with extensive colobomata and other congenital defects in both eyes.** *Journal American Medical Association*, March 7, 1908.

(20) **Pearson, J. Sidney.—A case of multiple congenital defects.** *Lancet*, March 21, 1908.

(21) **Chavasse, P.—Note on a case of high hypermetropia, with optical measurements.** (**Note sur un cas d'hypermétropie forte avec mensurations optiques.**) *Revue générale d'ophtalmologie*, 31 mai, 1908.

(22) **Reis, W.—A little known typical abnormality at the entrance of the optic nerve : circumscribed excavation of the papilla.** (**Eine wenig bekannte typische Missbildung am Sehnerveneintritt : umschriebene Grubenbildung auf der Papilla n. optici.**) *Zeitschrift für Augenheilkunde*, Juni, 1908.

(23) **Tyson, Henry H. — A case of unilateral congenital fistula of the lacrymal sac, with a review of the literature.** *Archives of Ophthalmology*, July, 1908.

(24) **Wintersteiner. — Another case of congenital filiform ankyloblepharon.** (**Ein neuer Fall von Ankyloblepharon filiforme adnatum.**) *Arch. f. Augenheilkunde*, Bd. LIX, Heft 2, S.196-200.

(1) **Koerber's** paper discusses the normal arrangement of stroma and blood-vessels in irides of different colours, congenital variations, anomalies, and pathological changes. A. LEVY.

(2) **Cosmettatos** describes three instances of the condition usually known as coloboma of the optic nerve. He points out that anatomical examinations have shown that, as a rule, the optic nerve and its sheaths are not implicated, but the deformity is situated entirely in the membranes forming the entrance of the optic nerve; and as the papilla in his cases showed no abnormality, he prefers to designate them by the name of "colobomata at the entrance of the optic nerve," suggested by von Hippel. Two of the colobomata described completely surrounded the disc and the third was on the temporal side. The author argues that their occurrence in such positions shows that they cannot be due to imperfect closure of the fœtal ocular cleft, and suggests that they were caused by intra-uterine choroiditis. R. J. COULTER.

(3) **Augieras's** patient, a lady aged 19 years, had narrowed palpebral apertures, due to an excess of skin at the internal canthus, which broadened the root of the nose and hid part of the white of one eye on the inner side. The puncta lacrymalia were displaced outwards, being situated only 2 mm. internal to a tangent to the inner side of the cornea. The canaliculi were double their normal length, and instead of following the margins of the lids and uniting immediately internal to their junction,

were continued separately for a distance in the redundant skin. To remedy the deformity, the redundant flap was divided with a Graefe knife by transfixion, probes having been first passed into the two canaliculi and brought into contact with each other, so as to locate the junction of the two passages and to avoid injuring them. The caruncle was then freed by dissection, and the edges of the conjunctival flap obtained by so doing were sutured to the edges of the skin wound. The cosmetic result was satisfactory to the patient. R. J. COULTER.

(4) **Müller** has analysed 795 cases of congenital amblyopia which occurred in the eye hospital at Halle during the course of five years. He excludes all cases of disease and of marked congenital defects, as well as all cases of squint amblyopias. He found in the majority of cases that these eyes were astigmatic from 1D. to 7D., and always more than the good eye. Of the other causes must be mentioned albinism, coloboma of the optic nerve, presence of medullated nerve-fibres, all more or less signs of degeneration. These cases are made up from reports of out-patients' cases, and hence leave much to be desired from the point of view of completeness. A. LEVY.

(5) **Hoeve** describes a case of exceptional interest, chiefly on account of the condition of the right eye, although both eyes of the patient were abnormal. Vision of the right eye was $\frac{5}{4}$. Examination of the fundus revealed a coloboma of the optic nerve, measuring nine discs in diameter. The optic disc was represented by a white area, which was surrounded by a ring of choroidal atrophy. The position of the retina corresponded to that of emmetropia, but the disc was displaced, so as to represent two dioptres of myopia, while on three sides of it there were excavations, measuring seven dioptres in depth. As regards the field of vision, a large coloboma corresponded to the entrance of the optic nerve. The outer limits of the field were normal as far as white was concerned, but the colour fields showed a deficiency above. The cornea of the right eye, as well as the left, was smaller than normal. The left eye, besides, showed a coloboma downwards of the lens, the choroid, and the optic nerve, 2·5 D. of astigmatism, V.= $\frac{5}{50}$, and a large defect in the visual fields, both for white and colours. Apart from the fact that cases like this are exceedingly rare, further interest attaches to them from the point of view of compensation, for, as Hoeve points out, it would be difficult to believe that the right eye had ever had full vision, supposing an accident happened to it. It may be added that the patient was doing military service, and that his shooting was above the average, while before he entered the Army, he had been a type-setter and lithographer.

PERCIVAL J. HAY.

(6) The long monograph (*thèse d'agrégation*) of **Bertozzi** (Florence) is a systematic study of persistent remains of the pupillary membrane, congenital irideremia, poligonia,

corectopia, congenital ectropion of the uveal pigment, congenital iris cysts, coloboma, albinism, vitiligo of the iris, heterochromia iridis, pigmented spots or nævi of the iris, so called "letters" or "figures" of the iris, and congenital iritis. As regards the ciliary body, the author makes a study of coloboma, atrophic conditions or sequelæ of intra-uterine cyclitis, and as regards the choroid, of colobomata, congenital choroidal aplasia (very rare), congenital angioma, albinism of the fundus, melanosis, and congenital choroiditis. The work does not lend itself to *résumé* of different chapters, but ought to be known to oculists who wish to publish on the same subject. A. ANTONELLI.

(7) **Giffo** (Quimper) records the case of a child, aged a fortnight, with small-looking eyelids joined to each other except in the inner third, where there was an opening through which could be seen an orbital cavity without any sign of an eye. The abnormality was present on both sides. R. J. COULTER.

(8) **Verderame** publishes a supplementary report on a case described by Christen in the *Archiv f. Augenheilkunde* in 1893. At that time both lenses were normal in position and clear. Both showed a coloboma. The right eye also presented a persistent pupillary membrane, and the left eye a coloboma of the iris and some atrophy of the choroid. R.V. $\frac{18}{200}$ c. — 9 D.sph. $= \frac{2}{5}$. L. V. $\frac{2}{5}$, Hm. 5.5 D.sph. not improved by correction. At present: R. V. $\frac{1}{10}$ c. + 4 D.sph. $= \frac{2}{7}$. L. V. $\frac{2}{7}$ c. — 1 D.sph. (!) $= \frac{2}{5}$. Both lenses are opaque and completely dislocated. Otherwise the eyes are the same as in 1893. PERCIVAL J. HAY.

(9) **Nance** (Chicago) describes an interesting case of supernumerary canaliculus. By the use of argyrol and the syringe it was clearly demonstrated that each punctum led into a distinct canaliculus and that each canaliculus led into the lacrymal sac, or into a common duct very near the sac proper, which, the author says, "is the more probable suggestion from an embryonic standpoint." The supernumerary canaliculus was of practically the same calibre as the normal one, the punctum, however, being a trifle larger and more of a slit than a round opening.

C. A. O.

(10) **Isakowitz** describes a case in which almost one-half of the circumference of the lens was represented by three nearly straight lines. The suspensory ligament, a few strands excepted, was absent along these lines. In spite of this, there was no undue mobility of the lens, and the latter was properly centred. The fundus presented two colobomas of the choroid and some irregularities in pigmentation, especially at the macula. There were a few punctiform opacities in the lens and also a few opacities in the vitreous humour. V. = fingers at 1 m. The lens was not large enough to receive all the rays entering the pupil, yet in contra-distinction to patients with dislocated lenses, Isakowitz's patient apparently had no diplopia. More careful

examination, however, showed that while the object of fixation was seen single, objects at the periphery of the visual field were seen double. This distinction offers a means in doubtful cases of ascertaining whether the lens is dislocated or not.

PERCIVAL J. HAY.

(11) **Fejér's** patient, a girl *ætat.* 8 years, exhibited a dense layer of pigment covering the optic disc of the left eye. Besides high myopia (13 D.), there were some other pathological changes in the shape of areas of choroidal atrophy and some spacing of the pigment. There was no evidence of congenital syphilis. No cause could be assigned for the condition. PERCIVAL J. HAY.

(12) **Noll's** patient is a girl, *ætat.* 2½ years. The right eye shows a dermoid tumour situated on the nasal side at the corneo-scleral junction, and another at the lower margin of the cornea. There is a coloboma of the iris downwards and inwards, and a coloboma of the choroid extending downwards. The left eye presents a large defect in the upper lid, three dermoid tumours at the margin of the cornea, a coloboma of the iris downwards and inwards, and a coloboma of the choroid downwards. On both sides of the nose a cleft extends downwards from the crista lacrimalis to the naso-labial sulcus. The author describes the case on account of the facial deformities co-existing with those of the eyes. PERCIVAL J. HAY.

(13) **Reis** gives the particulars of a case of congenital filiform anchyloblepharon with a view to clearing up the ætiology of these cases. The microscopic examination of the thread showed it to consist of a core of elastic tissue and capillaries, which was surrounded by several layers of epithelial cells. The author thinks that the presence of capillaries and elastic tissue supports Webster's theory, according to which the filiform threads are formed by two capillary loops lying opposite each other at the lid margins; these loops are pushed forward, owing to some injury in late fœtal life, and join each other at a time when the lids are merely glued together by some layers of epithelial cells. When solution of continuity occurs along the lid margins in the natural course of events, the strand of tissue formed by the capillaries refuses to give way and is drawn out in the shape of a thread by the movements of the lids. The author, therefore, supports the theory of an inflammatory origin of filiform anchyloblepharon as opposed to the developmental theory.

PERCIVAL J. HAY.

(14) **Posey** says that while congenital squint is comparatively uncommon, its early recognition is of the greatest importance, not only on account of the treatment of the ocular condition itself, but, also, if the squint be of central origin, by reason of the aid which the detection of the palsy in the eye muscles may give in the recognition of some obscure lesion in the nervous system.

"From the standpoint of treatment, the necessity for the early differential diagnosis between congenital and concomitant

squint cannot be insisted on too strongly, for each manifestly demands different methods for its correction. In congenital squint no form of orthoptic exercise is of service, operative measures alone sufficing to straighten the visual axes, while in concomitant squint orthoptic measures, if inaugurated early, will often, in conjunction with proper lenses, accomplish all that is requisite." He tells us that "the folly of subjecting paralytic cases to the strain and annoyance of amblyopic exercises is apparent, and this method, which is so potent in the cure of concomitant cases should not, therefore, be essayed. Refraction errors should be corrected, with a view to improving the vision in both eyes, though as both organs are employed in fixation, amblyopia ex anopsia does not develop in these cases."

He believes that "the operative treatment of congenital squint obviously presents very great difficulties, but as the deformity is often very marked, its relief should always be attempted. Before proceeding to operation, however, it goes without saying that the ophthalmologist should first study the case in all its details, with a view to discovering, as far as is possible, the muscles at fault and the direction in which the movements of the eye need supplementing or curtailing. At times, exploratory incisions over the normal insertions of the muscles are of advantage before the actual muscle which is to be operated on is selected. In many of these cases the absence or under-development of a muscle or the presence of fibrous bands will so modify the rotation of the eyes that all rules which govern the operator in the performance of operation in ordinary cases of squint must be abandoned, and he will be compelled to proceed on entirely new lines. Tenotomy of one or more muscles with advancement of associates will usually have to be performed, for a single operation rarely suffices to materially improve the condition." He thinks that "operative procedure in this class of case should be performed in the neighbourhood of 10 years of age; the permanent character of the deviation is rarely fully established until that age, and in the event that advancement is demanded, younger subjects are usually too restless to permit of the immobility of the eyes which is so desirable after advancement and the tissues of the eyes too delicate to enable the stitches to be properly embedded."

CHARLES A. OLIVER.

(15) **Breuil** records a case of typical posterior venæ vorticosæ (choriovaginal veins) occurring in a woman, aged 24, with myopia of 15D. and congenital absence of pigment in the whole posterior polar region. He discusses the views which have been expressed as to the nature of the abnormality. R. J. COULTER.

(16 **Cosmettatos** records three cases of microphthalmia, two monocular and one binocular. In the first, the eye was about half the normal size, had a clear cornea, a coloboma of the iris directed downwards, and a cataractous lens. In the second, the

eye was reduced to the size of a pea, and showed no sign of a cornea, but moved when the other eye was turned in different directions. A conjunctivo-fibrous fold, evidently an amniotic band, stretched from the shrunken eyeball to the inner angle of the conjunctival sac. The third case was that of an infant, with double microphthalmia and numerous other malformations, who died when four-and-a-half days old. In microscopic examination the following abnormalities were found in the right eye.—In the lids cystic cavities were present with walls formed by cubical glandular cells due to retention from blocking of the secretory ducts of the Meibomian glands or of the secondary canaliculi opening into them. In one specimen the excretory duct itself was seen distended into a cyst. In the cornea there was undulation of the lamellæ, with vascular and lymphatic infiltration of the parenchyma, proving the presence of a keratitis which had developed during intra-uterine life. The upper part of the iris was pulled backward and adherent to the lens, while in its lower part there was a coloboma through which a fibrous band passed which starting from the angle of the anterior chamber passed over the ciliary body and ended by becoming attached to the inferior part of the lens, confirming the theory of Hess as to the causation of iridic colobomata. The retina was much folded, filled the whole vitreous cavity and contained formations resembling the rosettes described by Wintersteiner as characteristic of glioma retinæ, but obviously due in this case to invagination. Finally, there was a mass of fibrous tissue containing three cartilaginous nodules, which springing from the vitreous cavity passed forwards to end by becoming attached to the posterior surface of the cornea and in some places penetrating deeply among the corneal lamellæ and becoming fused with them. The author discusses the ætiology of microphthalmia, and comes to the conclusion that his three cases were all caused by intra-uterine inflammation. R. J. COULTER.

(17) **Dupuy-Dutemps** records a case of amaurotic family idiocy, with typical ophthalmoscopic lesions, which he states to be the first observed in France. He discusses the pathology of the condition. R. J. COULTER.

(18) In **Peters'** paper is recorded a bilateral, diffuse, blue-gray discoloration of the sclerotics, associated with embryontoxon, which occurred in four generations, so that the hereditary factor stands out prominently. Either an abnormally thin or an abnormally transparent sclera, it remains doubtful which, must be looked upon as the cause of the anomaly. C. MARKUS.

(19) The interesting feature of **Pyle's** case was the remarkable preservation of useful vision in a microphthalmic eye with a corneal diameter of but eight millimeters. C. A. O.

(20) In addition to other defects, this child, seen at the Evelina Hospital, London, presented the following ophthalmic abnormalities, namely: occlusion of left nasal duct, left microphthalmos

with irido-choroidal coloboma, right irido-choroidal coloboma. The eyelids, lashes, and lenses were normal.

ERNEST THOMSON.

(21) **Chavasse** comments upon the great rarity of cases of hypermetropia of over ten dioptres, and gives an account of a case of his own in which there was H. of 18 dioptres without corneal astigmatism. The optical measurements, made by Tscherning, show that owing to the strong curvature of cornea and lens, the formation of the eyes was similar to that in the new-born. The eyes were not only short (axis 14.9 mm.), but there was increased curvature of cornea and lens, as if to compensate to some degree for the shortness. The origin (congenital or acquired) of high hypermetropia is also discussed by Chavasse. ERNEST THOMSON.

(22) **Reis** (Bonn) describes an abnormality of the optic disc which, although very rare, is quite typical. He has himself seen it four times in ten years, among 50,000 patients. These four cases he describes and illustrates by an excellent coloured plate. The condition consists of a round or oval excavation, about 1 mm. deep, placed close to the edge of the papilla, its diameter measuring about one-quarter that of the disc. In one case the excavation formed a protuberance on the side of the papilla, lying partly within it and partly without. The colour of the area is olive-green, the margin being always darker than the centre. The edge is not sharp, and there may be a partial covering by an excessively tenuous membrane. In one case a small artery passed into the excavation and lost itself there; in another, two small twigs originated from the modified area and passed into the retina. The appearance is not so much that of a hole opening anteriorly, as of a cystic defect in the mass of nerve-tissue just behind the surface of the papilla. The third case was complicated by a small macular hole, surrounded by a stellate figure of delicate, radiating streaks. This produced a central scotoma. In some cases a paracentral scotoma has been found which has been ascribed to the defect in the disc. The author has collected twenty similar cases from the literature of the subject and presents them in tabular form. He discusses the probable causes of the excavation, and finishes his paper with some remarks on macular holes. T. HARRISON BUTLER.

(24) **Wintersteiner** describes the histological characters of a case of filiform ankyloblepharon in a still-born child. The author obtained permission to remove the lids together with the eye, so that he could make a complete examination. He found that the filament was attached between the cilia in front and the Meibomian ducts behind. It consisted of a fine fibrous connective tissue containing a few blood-vessels, and was covered with squamous epithelium. Opposite the insertions of the filament the ciliary bundle of the orbicularis palpebrarum was poorly developed; otherwise the lids were normal. The author,

in discussing the ætiology of this and similar cases, expresses the opinion that they represent adhesions formed after an injury to the lid margins, and caused by the finger nails of the fœtus.

PERCIVAL J. HAY.

VIII.—XERODERMA PIGMENTOSUM.

Cuperus, N. J.—A case of xeroderma pigmentosum affecting the eyes. (Ein Fall von Xeroderma Pigmentosum mit Augenleiden.) *Arch. f. Augenheilkunde*, Bd. LIX, Heft 2, S. 178-181. Illust.

Cuperus records a case of xeroderma pigmentosum which he saw in a girl aged 10 years. The disease began with a skin affection when the child was three or four years old. Small, brown spots began to appear, which gradually became bigger and more deeply pigmented. Then the skin got thin, and warts began to

grow. When the child became older, red tumours developed above the eyes, associated with ectropion of the upper lids. None of the other members of the family was affected. Two

months before admission, a large tumour began to grow above the right eye. **State on admission.**—A poorly developed delicate-looking child. Skin of face, neck, and dorsal surface of the hands atrophic, covered with many pigmented spots, and poorly pigmented areas with telangiectases. The pigment spots seem to radiate from the head and hands to the covered parts of the body. Only the skin of the palms of the hands and the soles of the feet is normal. Over the right half of the face there is a dark, soft tumour, extending from the margin of the hair above to the angle of the mouth below, and from the nose to the ear (*see* figure). The surface is deeply cleft in various directions, and from the fissures there is a constant flow of purulent, sanguineous matter. The tumour was removed with the cautery and knife. At the operation it was found to be adherent to the upper surface of the upper lid and to the supraorbital margin. Otherwise there were no attachments. On microscopic examination, it presented the following features: irregular rows of epithelial cells, separated by small-celled connective tissue, very rich in nuclei. Cell-nests with a great deal of necrosis. Cells vary exceptionally with regard to size. There are many cell inclusions and numerous cells showing imperfect karyokinesis. Pigment and pigmented cells are not frequent. **Diagnosis.**—Carcinoma. The growth recurred (as had been expected), and the child died from cachexia.* PERCIVAL J. HAY.

IX.—ÆTIOLOGY OF ACUTE CONJUNCTIVITIS.

Sommer, G.—On the ætiology of acute conjunctivitis. (**Zur Aetiologie der akuten Conjunctivitis.**†) *Wochenschrift für Therapie und Hygiene des Auges*, Februar 27, 1908.

In the spring of 1907, **Sommer** spent an afternoon in spreading a sackful of Thomas' manure (*Thomasschlacke*), an artificial manure, on the turf of his garden. On turning out the sack when finished, he received a cloud of dust in the face and eyes, which he immediately cleansed by carefully washing with a running supply of cold water. The burning was slight at first but increased during the next few hours, when there was lacrymation, and a thin mucous discharge, accompanied by photophobia and a feeling as of a foreign body in the eyes. The symptoms were not severe enough to prevent him visiting a patient the same

*For abstracts of other cases, *see* THE OPTHALMOSCOPE, October, 1908, p. 831.

†This paper really is a short abstract of Augstein's paper in the *Klin. Monatsbl. f. Augenheilkunde*, 1907, Bd. II, Dezember, p. 563. See also Bondi in *Münchener med. Wochenschrift*, No. 15, April, 1908, of which Sommer gives an abstract in the *Woch. f. Ther. u. Hyg.* of 30 April.

evening, and recovery was complete a couple of days later. Thomas' manure consists of 17·5 per cent. phosphoric acid, 50 per cent. lime, of which 12 per cent. is in a free condition, while 7·5 per cent. occurs as salicylic acid. There are also small quantities of sulphur and sulphuric acid. Almost the entire substance dissolves easily and rapidly in water and also in the tears. There are now on record several cases of permanent injury or even of blindness resulting from its use among agricultural labourers. Where possible, artificial manures should be distributed by machinery, or when by workpeople they have to be warned to work with the wind and not against it, to employ protecting goggles, and to avoid touching the eyes. Children, or those with inflamed eyes, should be forbidden to work with artificial manures. W. B. INGLIS POLLOCK.

X.—THE EYESIGHT OF SCHOOL CHILDREN.

(1) **Thomson, H. Wright.—The eyesight of the poorer City children.** *British Medical Journal*, September 14, 1907.

(2) **Elkington, J. S. C.—An improved method of testing distant vision acuity in schools.** *Lancet*, September 12, 1908.

(3) **The eyesight of children attending Army schools in India.** *Lancet*, September 19, 1908.

(4) **Bradburne, A. Allison.—Testing the vision in school children.** *Lancet*, September 19, 1908.

(1) **H. W. Thomson** (Glasgow) speaking from large experience as oculist to the Glasgow School Board, has found that children vary in acuteness of vision according to their environment. He found that, taking all districts together, 14 per cent. of the total number of children had defective visual acuity without error of refraction or fundus disease. Analysis showed that the school with the greatest percentage of defectives (25 per cent.) was situated in a poor district in the centre of the city, while that with the lowest percentage (3 per cent.) was within sight of the open country. Further analysis showed that of city schools equally remote from the country those of the comparatively better class had a lower percentage of defectives than those of the poorer class. There seem, therefore, to be two causes at work, namely, an environment, with few opportunities of distant vision, and malnutrition, but the writer is unable to separate these two causes entirely, inasmuch as proximity to the country must of itself affect the nutrition. He purposely does not touch the question of feeding of poor school children, but suggests that in

the infant curriculum there is too much near work, such as sewing, and that it would be better to institute instruction by competitive games; objects or pictures at 20 feet or more should be displayed momentarily to the children who would then be asked to describe what they had seen. "On such a principle a great variety of games might be arranged, and an improvement in two most important attributes—namely, sharpness of distant vision, and quickness of observation—would result, which would amply justify the trouble involved." ERNEST THOMSON.

(2) The Chief Health Officer of the Education Department of Tasmania reports that Gertrude Halley and G. H. Hogg have introduced a test-type adapted from Landolt's optotype figure. In this new type several signs have been introduced for each degree of visual acuity, the breaks in the rings, which correspond to an angle of one minute, being placed in varying positions so as to minimize the chance of guessing. But in place of Landolt's method of notation from 0.1 up to 2, Halley and Hogg have preferred the Snellen system $\frac{6}{60}$, $\frac{6}{36}$, up to $\frac{6}{6}$.
ERNEST THOMSON.

(3) An anonymous Indian correspondent writes to the *Lancet* an account of the visitation of a number of Army schools in India. The results of the examination of the scholars, and of the schools as to lighting, desks, and books, show that considerable alterations in the conditions under which the pupils work are called for, and these alterations are stated in the form of a summary. ERNEST THOMSON.

(4) **Bradburne** (Southport), referring to the above note by Elkington (No. 2), considers that time is wasted in testing the visual acuity of children. He prefers a simple retinoscopy for the purpose of separating those requiring further attention. He claims "that all tests carried out by the usual methods of expressing what is seen at a certain distance are fundamentally defective, for the very simple fact that the individual whose eyeball is axially of a perfect length, is the very one who ought to be most carefully examined, in that there is no material left to allow for extension of the tissues of the eyeball." When the mirror test is used a "*tendency* to myopia" can be discovered or suspected before myopia has actually begun. All inspectors of such a function as the eyesight should be fully conversant with the use of the retinoscopy mirror. ERNEST THOMSON.

XI.—TRAUMATIC ENOPHTHALMOS.

Dunn, H. Percy.—A post-graduate lecture on traumatic enophthalmos. *Lancet*, August 15, 1908.

In an interesting lecture on traumatic enophthalmos, **Dunn** (London) divides the cases into three groups, namely, those following fracture of the long wall of the orbit, those due to cicatrical contraction of the orbital connective tissue, and, lastly, those in which the eyeball sinks after a blow upon the eyeball itself, or over the region of the orbit, more or less quickly, without any apparent reason. Only the last of these three conditions is discussed—one in which no adequate explanation seems to be apparent. The literature shows that apart from the cardinal signs, namely, shrinkage of the globe, phthisis, narrowing of the palpebral fissure, and diminution of tension, the cases vary in the period of onset, in duration, and in their intensity. The pupil may be contracted, dilated, responsive or not to light, and may or may not react to drugs. The external ocular muscles are frequently paralysed. The paralysis may or may not be permanent. The author regards these muscular changes as having only an adventitious relationship to the purely enophthalmos signs. As to vision, there is no rule. Enophthalmos *per se* does not affect it. When there is loss of vision, it is due to some serious ocular lesion attributable to the primary traumatism. It is a fact, also, that in one case of contusion enophthalmos may result without any further eye lesion, while in another there may be rupture of the choroid without any sign of enophthalmos.

In proceeding to account for traumatic enophthalmos, the author rejects the theory of Beer, *viz.*, that the shrinkage of the globe is due to absorption of the orbital cellular tissue and fat caused by lesion of the trophic peripheral nerves, because if a lesion was extensive enough to cause so marked a nutritional change, the eye could hardly avoid being involved in the process. van Duyse's theory, that the condition is due to post-traumatic tropho-neurotic affections, causing a gradual absorption of the orbital fat, is impossible where enophthalmos quickly follows the traumatism. Schapringer holds that the symptoms are due to paralysis of the sympathetic, but, apart from the paralysis of Müller's muscle, fails to explain how lesion of the sympathetic could cause enophthalmos.

A study of Jonathan Hutchinson, jun.'s 26 cases of removal of the Gasserian ganglion for facial neuralgia shows that, while the innervation of the eye and orbit was almost entirely arrested, no enophthalmos occurred after this operation—one which practically cuts off two-thirds of the innervation of the eye. The remaining third consists of the sympathetic branches supplied from the cavernous plexus. The author looks upon

the lenticular ganglion as the nerve centre which controls the nutrition of the eye, as well as the innervation of the involuntary muscle fibres of the eye and upper lid. If, next, a study be made of the symptoms of injury to the cervical sympathetic, they are found to include: (1) partial ptosis, (2) narrowing of the palpebral fissure, (3) contraction of the pupil, (4) diminution of tension, (5) sinking back of the eyeball, and (6) changes in the vascular supply of the face on the affected side. As regards the four cardinal signs of traumatic enophthalmos, namely, shrinkage of the globe, partial ptosis, narrowing of the palpebral fissure and diminution of the tension, the coincidence with the symptoms of paralysis of the sympathetic is obvious. Then, in answer to the question "Why should shrinkage of the globe occur as the result of the loss of sympathetic innervation?" the author, quoting Quain, refers to the fact that the check ligaments contain involuntary muscle fibres which are under the control of the cervical sympathetic. The loss of innervation to the check ligaments allows the eyeball to recede, "and the cause of the paralysis is probably due to concussion, contusion, or some lesion of the ocular nerve centre in the orbit, namely, the lenticular ganglion whose sympathetic root is involved in the injury. In short, traumatic enophthalmos depends, not upon trophic nerve changes leading to absorption of the fat and connective tissue of the orbit, but upon the disturbance of the sympathetic innervation of the eyeball, probably commencing in the lenticular ganglion." In answer to the question "How can sympathetic paralysis be present in those cases in which the pupil exhibits a normal reaction?" the author replies "that the paralytic signs present are dependent upon the extent of the injury which the sympathetic has received, and the special fibres which have been involved."

Notes of three cases are given. ERNEST THOMSON.

XII.—REMEDIES.

1. Frenkel, H.—Lumbar puncture in optic neuritis from intra-cranial hypertension. (La ponction lombaire dans les névrites optiques par hypertension crânienne.) *Ann. d'Oculistique*, T. CXXXIX, p. 1, janvier, 1908.

2. Monbouyran. — Antidiphtheritic serum in hypopyon ulcers. (Le sérum anti-diphtérique contre les ulcères à hypopyon. *La Clinique Ophtalmologique*, 25 janvier, 1908.

(3) Cosmettatos, G. F.—Remarks on the treatment by jequiritol of corneal and conjunctival affections. (Quelques remarques sur le traitement des affections de la conjonctive et de la cornée.) *La Clinique Ophtalmologique*, 10 février, 1908.

(4) Guillery.—Local anæsthetics and the treatment of corneal opacities caused by caustics. (Die Bedeutung der Anæsthetica für die Behandlung der durch Aetzgifte entstandenen Hornhauttrübung.) *Arch. f. Augenheilk.*, Bd. LXI, Heft 1, S. 38—85. Illust.

(5) Selenkowsky, J. W.—Can trachoma be cured with Becquerel rays (radium)? (Zur Frage ueber die Heilung des Trachoms durch Becquerelstrahlen.) *Arch. f. Augenh.*, Bd. LX, Heft 1, April, 1908, S. 63-91. Illust.

(6) Butler, T. Harrison.—The treatment of trachomatous dacryocystitis. *Lancet*, May 2, 1908.

(7) Bonsignorio, Doctoresse.—On the use of cold and of heat in ocular therapeusis. (De l'emploi du froid et du chaud en thérapeutique oculaire.) *Revue générale d'Ophtalmologie*, 31 mai, 1908.

(8) Galezowski, J.—The treatment of corneal opacities by thiosinamine. (Traitement des taies de la cornée par la thiosinamine.) *Recueil d'Ophtalmologie*, juin, 1908.

(9) Abadie.—Clinical and therapeutical considerations with regard to sympathetic ophthalmia. (Considérations cliniques et thérapeutiques sur l'ophtalmie sympathique.) *Ann. d'Oculistique*, T. CXXXIX, p. 409, juin, 1908.

(10) Valude.—The time for enucleation in sympathetic ophthalmia. (Le moment de l'énucléation dans l'ophtalmie sympathique.) *Ann. d'Oculistique*, T. CXXXIX, p. 142, juin, 1908.

(11) Terson, A.—The indications and technique of surgical closure in wounds of the eye. (Indications et technique de l'occlusion chirurgicale dans les plaies de l'œil.) *Gazette des Hôpitaux*, 4 et 11 juin, 1908.

(12) Lundsgaard, K.—Remarks on the treatment of trachoma with concentrated light ad modum Finsen. (Bemerkungen ueber die Behandlung des Trachoms mit Konzentriertem Licht ad modum Finsen.) *Klin. Monatsbl. f. Augenheilkunde*, Juni, 1908.

(13) Birch-Hirschfeld.—On the action of Roentgen rays upon the human eye. (Zur Wirkung der Röntgenstrahlen auf das menschliche Auge.) *Klin. Monatsbl. f. Augenheilkunde*, August, 1908.

(14) Harman, Bishop.—Glycerine as an adjuvant to silver nitrate. *British Medical Journal*, September 12, 1908.

(1) **Frenkel** records the case of a female patient, aged 21 years, who suffered from an apyretic affection, characterised by intense headache, slight constipation, vomiting, epileptiform convulsions, delirium, disorders of sensation in the form of zones of anæsthesia and of hyperæsthesia, attacks of tachycardia and of polypnœa, a temperature curve of the inverse type, neuro-retinitis with choked disc, amblyopia, diplopia, ptosis, blepharospasm, and photophobia. The Calmette reaction was negative. Lumbar puncture was performed twice and on each occasion was followed by marked improvement in the condition of the patient. The fluid withdrawn was clear, did not coagulate on boiling, did not give any deposit on centrifuging, and did not contain lymphocytes or cells of any other form. The patient also had a large number of mercurial injections (grey oil) and eventually made a good recovery. Although Frenkel admits that a number of the symptoms were probably of a hysterical nature, he considers there was also a definite serous meningitis present, as shown by the presence of optic neuritis for over a month, and by the fact that at each of the lumbar punctures an excessive amount of cerebrospinal fluid was found to be present.

R. J. COULTER.

(2) **Monbouyran**, speaking only of corneal ulcerations complicating "lacrymation" of old standing, considers that Roux antidiphtheritic serum is specially useful, since so many of these patients cannot be seen daily. Its action lasts for several days. Six cases are related in which the serum was employed, but as local treatment was used also, the actual proof of the value of the serum would seem to be wanting. On the other hand, one may accept the author's statement that before using serum treatment, he had never seen six patients in succession entirely cured by ordinary treatment. In spite of cauterization, Saemisch section, subconjunctival injections, and so on, he had always lost about one-half of these eyes from panophthalmitis. The dose of serum employed was 10 c.c., and, from a study of the cases, it appears to have been used, on an average, about every three days. Atropin, dionine, collargol, yellow oxide ointment, and so on, were used locally, as required. Four out of the six patients finally had useful vision, the two others failed to return after the ulcer had healed.

ERNEST THOMSON.

(3) Römer's jequiritol is a preparation of abrine, the active principle of jequirity. It is made in four strengths. Römer's jequiritol serum, prepared by immunising animals with abrine, has the property of annulling the inflammation caused by jequirity. **Cosmettatos** (Athens) has treated a number of patients, more especially those with trachoma, with jequiritol. He begins with one drop of solution I, increasing by one drop every day up to four, goes on to solution II, from one to four drops in the same manner, finally using solutions III and IV. Inflammation is usually produced during the use of solution III.

When the inflammation is at its height the drug is stopped until reaction has ceased. If the desired result has not been reached, treatment is started again with the solution which has previously caused inflammation. Without going into details of the results, it may be said that cases of chronic trachoma with pannus were much benefited. The cornea cleared up very markedly and vision was greatly improved. A good result was also obtained in a case of recent interstitial keratitis. In acute trachoma jequiritol treatment was useless, because the granulations reappeared after the inflammation caused by jequiritol had subsided. In only one case was Cosmettatos obliged to use jequiritol serum: it caused cessation of pain and inflammation, but the cornea was ultimately more opaque and the vision lower than before the treatment.

ERNEST THOMSON.

(4) **Guillery's** present contribution deals with a number of local anæsthetics and the part they play in the changes produced in the cornea by the action of caustic agents. It appears that the analgesic effect of substances like cocain is accompanied by more or less destruction of the corneal epithelium, and apparently the degree of destruction varies directly with the depth and duration of the anæsthesia. Probably, the death of the epithelium is caused by the abeyance of the nutritive control of the nervous system, the latter result, of course, being directly due to the anæsthetic and unavoidable. The epithelium, however, forms a formidable barrier to the passage of any fluid through or into the cornea, and when it is removed, any fluid, *e.g.* a caustic, will diffuse more or less readily into and through the corneal tissues. Guillery, therefore, warns against the application of a lead lotion along with or after a local anæsthetic. On the other hand, the action may be very desirable, *e.g.* when the aim is to secure a thorough diffusion of a solvent for any deposit in the cornea, such as lead.

PERCIVAL J. HAY.

(5) **Selenkowsky** gives a brief summary of the effects of radium on cell-life, and then presents in detail the results he has obtained with radium in the treatment of trachoma. The Becquerel rays exert a cytolytic action, especially upon lymphoid cells and on cells in process of proliferation. They produce disintegration of the chromatin, thus interfering with the nutrition of the cell and causing its death. The author experimented with radium bromide, 10 mg. of which he placed in a glass tube, 10 mm. long, 2 mm. in diameter, and with walls approximately 0.3 mm. thick. With this he first experimented upon rabbits' eyes and upon his own eyes. In rabbits he also tried 30 mg. and in his own case 1 mg. The eyes were exposed directly to the influence of the rays. Selenkowsky found that an exposure of 10 minutes' duration, with 10 mg., at intervals of one to three days, had no harmful effect. A reaction followed in about a fortnight after the first exposure. Having

proved that a direct exposure produced no ill-effect, it followed, as a consequence, that the rays could not harm the eye, when made to act upon the conjunctiva of the everted lids. He then proceeded to try them in 25 typical cases of trachoma. His results were as follows.—Radium exposures with a maximum quantity of 10 mg. radium bromide, and a maximum duration of ten minutes are harmless for the eye. In cases of trachoma, without severe catarrhal complications, the effect of radium is very great. The trachoma bodies disappear without leaving a scar, and they do not recur. No pathological changes are produced in the conjunctiva. In cases of trachoma of the granular variety, with general infiltration and secretion, radium effects the disappearance of the granules and the infiltration, and diminishes the secretion. In the treatment of granular trachoma, then, radium is not only equal, but superior to the medicinal and mechanical methods in use. The duration of treatment of these two forms of trachoma is shorter with radium than with the ordinary remedies. When the follicles are widely distributed, exposures of ten minutes are best, and it is preferable to treat the whole of the conjunctiva at one sitting. In slight cases five minutes may be sufficient. The effect on the granules is sometimes greater after one exposure of ten minutes than after two exposures of five minutes.

The first effects are seen after the second or third sitting, sometimes after the first sitting. The effect of radium is not so great in the stage of trachoma characterized by scar formation; nevertheless, the remaining granules and the infiltration disappear and the pannus often improves. As compared with other remedies in these cases, radium is sometimes better, sometimes not so good. The radium rays are apt to cause some irritation of the conjunctiva, so that the intervals between the exposures must be longer. For this reason, the treatment in these cases takes longer; still, many patients improve in the course of two or three months, who have been trying other remedies for years. Radium is an excellent analgesic, especially in acute pannus. It also exerts a cumulative effect, so that the exposures should not be repeated oftener than twice a week. After the disappearance of all the granules and the infiltration, it is still necessary to go on with one or two more exposures. The swelling which sometimes remains after this, disappears spontaneously. Any catarrhal symptoms that may be left yield to astringents.

The radium must be very active, in order to obtain good results. If its activity is unknown, it must be determined by experiment on the eyes of a rabbit, and on the healthy skin. It is best to place the radium in a glass tube, shaped so as to follow the curvature of the lids, and with sufficient surface for the passage of the rays. The surgeon should not use radium 10 mg. or even less) upon the eye itself, so as to avoid any untoward effect. He should only use it for treating the

palpebral conjunctiva. The symptoms of irritation and superficial necrosis of the epithelium sometimes seen, especially after frequent exposures, are no cause for alarm, and in most cases, careful radiation does not cause any symptoms of this kind. Since radium therapy is quite painless, it is particularly useful for children, and nervous and anxious patients.

In conclusion, the author says that he does not regard radium as a panacea for trachoma, nor does he mean to assert that recurrences never occur. An experience of many thousands of cases would be necessary for such an assertion. Recurrences occur as in other methods of treatment, and need deter nobody from trying radium. He thinks that probably radium will not be used by itself alone, but along with other remedies.

PERCIVAL J. HAY.

(6) **Butler's** experience in Palestine leads him to state that trachomatous dacryocystitis requires very careful treatment, inasmuch as the tissues about the sac are exceedingly friable, and easily allow the passage of fluids into the surrounding tissues. In one case mere irrigation with boric lotion led to the forcing of pus into the orbit, with resulting cellulitis and optic atrophy. The author deprecates the use of a solution of argyrol or protargol stronger than 5 per cent. in these cases. The use of probes is very liable to cause damage, and the resulting organic strictures are incurable. In the opinion of the author, if a case of this kind of dacryocystitis cannot be rapidly cured by simple lavage and protargol, the sac should be extirpated. ERNEST THOMSON.

(7) This attempt by **Bonsignorio** to state the various occasions on which cold or heat are the more properly applicable to the amelioration of eye diseases, does not strike one as particularly successful, because it is too dogmatic. In mentioning the methods of application of heat and cold, the authoress confines her attention to compresses, lotions, and such like, and makes no mention of such methods as the electrical device of Maddox, the Japanese hot-box, or even of the use of ice.

ERNEST THOMSON.

(8) **Galezowski** (Paris), has used thiosinamine in solutions of 5% to 15% for corneal nebulæ with very satisfactory results. These solutions are used in an eyebath and are well borne as a rule. Should they give rise to a little redness of the eye, after a few days' application, they must be discontinued for some days, and if their application causes pain a few drops of cocain may be instilled beforehand. The baths are used once or twice a day for about five minutes at a time. In the case of children the same solutions are used in the form of drops. Galezowski's results in 26 cases were as follows: 9, very marked improvement; 11, appreciable improvement; 6, no change. In the course of some weeks the leucoma can be seen to be less white and less visible, and although it does not disappear altogether, it soon allows of the easier transmission of light. J. JAMESON EVANS.

(9) **Abadie** (Paris) considers that in the presence of sympathetic ophthalmia the exciting eye should not be removed unless its vision is quite destroyed. In cases in which the injured eye retains its shape and size almost normal and has still a little vision, he cauterises the wound very thoroughly and covers it with a flap of conjunctiva. He finds that this is at times sufficient to cure the sympathetic disease, but if it is not, he has recourse to mercurial inunctions and injections, reserving enucleation as a last resource. He considers that late cases are due to incomplete healing of the wound, with absence of protecting epithelium, and recommends the same treatment for them. R. J. COULTER.

(10) **Valude** (Paris) considers that every injured eye which has lost all useful vision should be enucleated before the signs of sympathetic disease have appeared, but that when the second eye has become affected, the influence on it of removal of the "exciter" is very doubtful, and the latter should, therefore, be retained as long as it has any sight. He believes that sub-conjunctival injections of corrosive sublimate, as suggested by Abadie, are a useful adjunct to the general mercurial treatment of sympathetic ophthalmia, and records the cases of two children in which the course of the disease was very similar, although the exciting eye was removed in one and retained in the other.

R. J. COULTER.

(11) This is a somewhat loosely written article by **A. Terson** (Paris) on the difficult question of the treatment of wounds of the eyeball by suture. It is largely historical. There are two methods of using sutures in these cases : firstly, the direct union of the lips of the wound ; secondly, protection of the wound by covering it with conjunctiva or by suturing the eyelids, or by both of these. The objection to various kinds of suture material for scleral wounds are mentioned. For example, if catgut is used it may be too strong, which is bad, or too fine, which leads to unduly rapid absorption. Metal stitches are apt to wound the parts. The author prefers reindeer tendon Nos. 00 and 000. These remain intact for several weeks. They are sterilized in tubes in alcohol vapour. General indications for suture are given. The author's own rule is that having decided to attempt the preservation of the eye, suture is to be applied if the wound gapes ; if it does not gape, a conjunctival flap is to be stitched over it. Tarsorraphy may be done in addition. But Terson is evidently prepared to admit that the question of suturing large scleral wounds is essentially one for decision by each individual surgeon. "For wounds of the eye, even penetrating wounds, suturing will only be practised in good earnest ; with good material, good anæsthesia, in cases where one can be sure that the suture or autoplasty will not of itself or through its execution aggravate matters, and will be, on the contrary, really useful. Such can only be the case when it is

applied immediately and in a proper manner. . . . In the knowledge that suturing cannot always be done, and that it is always a delicate operation, the surgeon will require all his tact and experience." ERNEST THOMSON.

(12) **Lundsgaard**, who had seen good results from light treatment in conjunctival lupus,* tried the efficacy of the Finsen lamp in trachoma. As the latter disease is rare in Denmark, the test could not be carried out on a large scale. But it became sufficiently clear that follicles, simple or trachomatous, disappear swiftly after a few exposures of the conjunctiva, lasting from five to fifteen minutes. The lids are held everted by preference, but lid-eversion can be dispensed with by the use of prismatic pressing glasses. A latent period of twelve to twenty-four hours' duration is followed by swelling and redness of the mucous membrane, increased secretion and, in most cases, the formation of a thin pseudo-membrane. The granulations begin to disappear on the third or fourth day, the inflammatory symptoms lasting about a week. One patient was found still cured after a lapse of two months. (The reviewer refers to the action of radium, which effects a speedy but transitory disappearance of trachoma-follicles.) C. MARKUS.

(13) **Birch-Hirschfeld** (Leipsig) examined with Zeiss's corneal microscope the eye of a patient which had been subjected to a single prolonged exposure to X-rays several years ago. He found rosary-like swellings of the conjunctival vessels in the temporal half of the eye. The underlying microscopical change he surmises to be the so-called vacuolising degeneration of the intima, which has been described as the result of exposure to Roentgen and radium-rays and high frequency currents. In this case the rays were employed on account of a cancroid of the left outer canthus. The long delay in the appearance of the vascular changes is remarkable. Of earlier changes were observed a severe conjunctivitis which set in a fortnight after the sitting, a partial loss of eyelashes, and a corneal opacity resembling an arcus senilis, also cataract developed in this eye, but it is only possible, not certain, that the X-rays are responsible for it. C. MARKUS.

(14) In order to avoid the pain which attends the use to the eyes of solutions of silver nitrate, **Harman** (London) adds 15 per cent. of pure glycerine. The addition of the glycerine is stated to increase the penetrative action of the silver.

* *See* THE OPHTHALMOSCOPE, 1906, p. 478.

BOOK NOTICES.

Transactions of the Ophthalmological Society of the United Kingdom. Volume XXVIII. Session 1907 - 1908. London: J. and A. Churchill, 7, Great Marlborough Street. 1908. Price, 12s. 6d.

The twenty-eighth volume of the *Transactions* of the Ophthalmological Society of the United Kingdom has just been issued to members of the Society. It contains several contributions of sterling value, numerous illustrations, and shows evidence of careful editing.

The Bacteriology of the Eye. By Dr. THEODOR AXENFELD. Translated by ANGUS MACNAB, Chief Clinical Assistant Royal London Ophthalmic Hospital. With 87 illustrations, some of which are coloured, and three coloured plates. London: Baillière, Tindall, & Cox, 8, Henrietta Street, Covent Garden, W.C. 1908. Price, 21s. net.

Thanks to Mr. Angus Macnab, a translation of Axenfeld's *Die Bakteriologie in der Augenheilkunde* (1907) is now at the disposal of English readers. The book will be welcomed by all ophthalmic surgeons who are convinced that clinical work and bacteriology should go hand in hand. The text of Mr. Macnab's admirable translation has been augmented by Axenfeld, and extended so as to include references to work published since the original appeared in Germany. How very valuable these additions are may be seen on reading sections dealing with such subjects as syphilis, trachoma, and endogenous infections. Thus, as regards trachoma, the small granules, called *Chlamydozoa* by Prawoczek, described as present in trachoma cells by Halberstaedter, Prawoczek, and Greeff, are mentioned, and an opinion is expressed that it is as yet doubtful whether they are in the nature of parasites or not. Again, Luerssen's three negative inoculations of the human conjunctiva with the small bacilli described by L Müller as the cause of the disease are noted. Axenfeld believes that when the organism in question is found in a case of trachoma, it represents merely a mixed infection. Speaking of syphilis, the recent work of Stargardt, who demonstrated numerous spirochætæ in the deeper layers of the cornea in syphilitic children, and of the reviewer, who found the organism in cases of keratomalacia in specific babies, is alluded to.

The high opinion of the original work expressed in THE OPHTHALMOSCOPE of June, 1907, is confirmed after perusal of Mr. Macnab's translation. The translator has endeavoured to get over a difficulty pointed out in these columns—namely, the difficulty that English readers might experience from the fact that we do not yet possess an international

nomenclature — by adopting the nomenclature authorised by the Royal College of Physicians of London. With regard to bacteria, where that standard failed, Macnab has employed the name used by the first writer on the subject.

Mr. Macnab's translation runs smoothly, although it follows the original text closely. Errors are infrequent, but "Greef" should be "Greeff"; "Andrad," "Andrade"; "Hala," "Hála"; "Beal," "Béal"; "Cunningworth," "Cullingworth"; "Dinoux," "Dianoux"; and "Salings," "Saling." On page 262 we observe a discrepancy between translation and original, inasmuch as the "20 to 50 per cent." of the latter has become the "20 to 30 per cent." of the former.

The book is beautifully printed and illustrated, and is provided with an index on a somewhat more elaborate scale than the original. It is a little unfortunate that the references given in the index do not invariably correspond with the text.

SYDNEY STEPHENSON.

Einführung in die Pflege von Augenkranken. (An Introduction to Ophthalmic Nursing.) Von Dr. H. GOERING, mit einem Vorwort von Prof. Hermann Pagenstecher. Wiesbaden: Verlag von J. F. Bergmann, 1907.

This is a small book primarily intended for the use of sisters and nurses engaged in Professor Pagenstecher's Eye Hospital in Wiesbaden, and is the outcome of instructions which were written out as necessity arose regarding the nursing of eye patients in this institution. These instructions have been collected and systematically arranged by Dr. Goering, and are now offered to a larger circle than that for which they were first intended. The book is divided into four sections: (i) the human eye; (ii) general care of patients; (iii) helping at operations; (iv) nursing after operations.

Regarding the first section the subject-matter is necessarily "scrappy," and might as well have been omitted, four pages only being devoted to the anatomy of the eye and the physiology of vision.

All nurses engaged in ophthalmic work should attend lectures on the anatomy of the eye, illustrated by a good model which can easily be taken to pieces. This would be more useful to them than many pages of printed matter.

The second section is good and everything that a nurse should know regarding eye patients, she is told how to do—in the out-patient room, private practice, the nursing home, and in poor-law practice. Regarding the latter, attention is drawn to the importance of the use of soap and water as a means of prophylaxis and of attending to the eyes of newly-born children.

In the section on help at operations full instructions are given for the preparation of the patient, bed, operating room, instruments and bandages, as well as lotions, drops, etc., and the after-care of the patients is described in the fourth section.

It is a good little book, in which much information is given in very small space. A rather unusual feature is that it is printed in German text, while the vast majority of kindred publications are fortunately printed in Roman type.

GEORGE H. OLIVER.

The Ophthalmic Year Book. Volume V. By EDWARD JACKSON, GEORGE E. DE SCHWEINITZ, and THEODORE B. SCHNEIDEMAN. Illustrated. The Herrick Book and Stationery Company, Denver, Colo., U.S.A. 1908.

The *Ophthalmic Year Book*, which contains a digest of the literature of ophthalmology, together with an index of publications, for the year 1907, excels any of its predecessors in completeness and lucidity of treatment. It is well illustrated. It has been prepared with great care, and the result is that we now have in the English language a digest that need fear no comparison with any foreign publication. The compilation is a credit to all concerned, and is simply indispensable to anybody who desires to keep in touch with recent ophthalmological literature. Money spent on this book is well spent!

SYDNEY STEPHENSON.

Iconographie Stéréoscopique Oculaire (Anatomie.—Clinique technique opératoire). By Dr. ALBERT MONTHUS, ophtalmologiste des hôpitaux. Ire série, 25 planches. Paris: Masson et Cie., 120, Bd. Saint-Germain. 1908. Price, 5 francs.

Dr. Monthus's cardboard box contains twenty-five stereoscopic pictures, together with an explanatory pamphlet, couched in commendably brief language. The series of pictures includes views of the orbit and accessory sinuses, diseases of the orbit, ulceration of the cornea, and dacryocystitis, as well as of certain operations, such as tarsorraphy, transplantation of the border of the eyelids, the passage of lacrymal probes, extirpation of the lacrymal sac, and de Lapersonne's *exentération ignée*—that is, a substitution for enucleation in cases of panophthalmitis. The illustrations of disease are evidently from life, but those representing stages of operations apparently represent operations performed on the dead subject, and on that account are wonderfully clear. Altogether, the stereoscopic pictures are interesting, and will probably be welcomed both by students and practitioners.

SYDNEY STEPHENSON.

Pulsating Exophthalmos: its etiology, symptomatology, pathogenesis, and treatment; being an essay upon an analysis of sixty-nine case histories of this affection. By GEORGE E. DE SCHWEINITZ, M.D., Professor of Ophthalmology in the University of Pennsylvania, and THOMAS B. HOLLOWAY, M.D., Instructor in Ophthalmology in the University of Pennsylvania. 8vo., pp. 124, W. B. Saunders Company, Philadelphia and London. 1908. Price $2.00.

Study of this most interesting and valuable work, shows that the three objects of the essay—to analyse the sixty-nine cases considered; to elaborate and to compare the therapeutic measures which have been employed in their treatment; and to endeavour to determine from these analyses the surgical procedures which seem likely to prove of the greatest advantage in the control of the symptoms of this disease—have been fully accomplished.

Analytically, it was found that the traumatic cases were in excess. Exophthalmos, pulsation, bruit, venous ectasiæ at the inner angle of the orbit, and red, swollen, and œdematous lids and conjunctivæ, are the dominant signs and symptoms. Vision is, as a rule, impaired. The cornea is, at times, involved, and the iris may be affected. The main fundus lesions are, in the majority of instances, limited to a venous stasis, although in some cases, graver secondary disturbances, mostly connected with the vascular stems, may be noticed. Ocular muscle motility is a pronounced characteristic.

Therapeutically, the authors consider the permanent usefulness of the various well-known methods of treatment and surgical procedures which they have found distributed throughout their series, and have come to the conclusion that considering the uniformly successful results of operation upon the superior ophthalmic vein, "it would seem that this procedure should be considered before ligation of the carotid, and certainly should precede ligation of the second carotid, provided the first operation has failed to produce the desired result." They give warning, however, of the possibility of the production of thrombosis of the basal sinuses in orbital venous ligation and operation; the present number of cases with their high proportion of temporary unfavourable symptoms being still too few for definite determination.

The authors state that in all doubtful cases there should be a thorough examination of the accessory cavities and sinuses The X-rays should be also utilized, particularly in cases where there has been cranial fracture, and where foreign bodies have been probably retained; being also useful when it is desired to demonstrate the condition of the osseous walls of the orbit.

The work, which is monumental for patience, careful analyses, and logical conclusions, should be read most carefully by all ophthalmic surgeons who desire to keep in touch with the latest and best views upon the subject. CHARLES A. OLIVER.

Die Angeborenen Fehler und Erkrankungen des Auges. (Congenital Anomalies and Diseases of the Eye.) By Dr. Albert Peters. Bonn: Verlag von Friedrich Cohen. 1909. Price, 7 marks net.

This book of 262 pages, illustrated by sixteen text-figures and one plate, contains an account of congenital anomalies and diseases of the eye by Professor Albert Peters, of Rostock, Germany. It is divided into four main sections, namely: I. The anatomical and physiological peculiarities of the eye of newly-born children; II. Malformations of the eyes and of their appendages; III. Fœtal inflammations of the eye; and IV. Birth injuries of the eyes.

An introductory chapter deals with the peculiarities of the eye of newly-born children. The anatomical features of the infantile orbit are described, and measurements given. Narrowing of the orbit is said to follow removal of the eyeball in infancy, and it is doubtful whether this deformity (the existence of which has been denied by some competent authorities) can be avoided by exenterating instead of removing the eye. The eyeball in the newly-born is spherical, there being little difference between the vertical and sagittal diameter. It grows proportionately more quickly during the earlier years than does the rest of the body (Weiss). In attempting to investigate the anatomy of the parts it must not be forgotten that the fluids employed for hardening the eye, as Müller's fluid and formol, are liable to produce changes in one or other part, and Peters devotes a few lines of description to such artefacts. The cornea of the newly-born is larger, relatively speaking, than that of the adult. It is thicker towards its margin. There are, however, individual differences in the thickness of the cornea, and also of its individual constituents, as Descemet's and Bowman's membrane. The radius of curvature of the infantile cornea varies between 7mm. and 7.07mm. The sclera also shows variations as regards its thickness, which is more pronounced towards the posterior pole. A bluish appearance is not uncommon in the anterior parts of the infantile eye, owing to tenuity of the sclera. The appearance of the crystalline lens will vary in accordance with the freshness of the eye and the hardening fluid employed. Thus, staining and Müller's fluid tend to make it swell, whereas formol causes a shrinkage, especially in the sagittal direction, and sometimes even produces a circular depression of the anterior surface between pole and equator. The lens of the newly-born is soft and devoid of nucleus. The fibres of the suspensory ligament are more numerous in the newly-born than later, and they originate from the ora serrata and proceed to the hinder surface of the iris, from which later they disappear with the growth of the ciliary processes (Merkel, Kallius, and Lange). The sphincter iridis is broad and well-developed. The ligamentum pectinatum in the newly-born is more traversed by endothelium and its trabeculæ

are shorter than in the adult. The ciliary body is less developed than in the adult. The choroid is distinguished by its poverty in pigment. According to Merkel and Orr, a potential supra-choroidal space is present, but v. Hippel believes that the space in question is an artefact. The fovea centralis is very flat, no reflex is present, and it is as yet from the functional point of view very imperfect. The retina is thinner than in the adult, very soft, and inclined to be diffluent. The optic papilla is of light colour, and only a few 1/10 mm. narrower than in fully-developed eyes. The grey-blue colour of the optic disc observed during the first few days of life is said by v. Sicherer to be due to hæmorrhage into the sheath-space. The white substance of Schwann is absent at birth (Bernheimer and v. Hippel). The tear passages show only inconsiderable variations as compared with those of the adult.

Photophobia, present in the newly-born infant, diminishes after the lapse of a few days. At birth the pupils respond to light, but only the power to distinguish light from dark appears to exist. The ability to recognize colour is first formed after the second year of life (Preyer), and children of three years are often able to name colours quite correctly. Yellow and red are usually recognized earlier than green and blue. The associated eye movements are congenital, and binocular fixation generally appears from a few days to several weeks after birth. In the newly-born blinking may be absent (Preyer), infrequent (Silex), or regularly present (Fick and Gürber). According to Pfister, the width of the pupil increased from the first month of life to the sixth year, as does also the amplitude of reaction. de Vries has pointed out that the pupil in newly-born infants responds but moderately to mydriatics. Refraction of the eye is almost constantly hyperopic (average 2.3 D).

Peters attaches little importance to the influence of fœtal inflammation as a cause of "congenital anomalies." In his opinion, inheritance plays the most important part in ætiology. Consanguinity acts merely by heightening any potential heredity which may exist on one or both sides, the so-called "convergent heredity" of some writers. Mesodermal anomalies and variations account for many malformations of the eye—as, for example, coloboma, microphthalmos, corectopia, ectopia of the lens, irideremia, vascular anomalies, and anophthalmos with bulbus cysts. Amniotic adhesions may account for a number of the more superficial malformations of the eye, as coloboma of the eyelids, cryptophthalmos, circumcorneal dermoids, and perhaps epitarsus. But the fact that these often coexist with other malformations due to heredity, such as harelip and cryptorchidism, perhaps indicates that the amniotic factor itself is of hereditary origin.

In its general arrangement Peters' book follows the lines of the Graefe-Saemisch *Handbuch der gesamten Augenheilkunde*

that is to say, to each subject is devoted a clearly-written section, followed by a bibliography of the authors quoted. The arrangement is obviously a gain from the reader's point of view. British and American references are tolerably numerous, but it is a pity that so many mistakes have been made in the spelling of names. The following should be corrected in a second edition (should such be called for) of Peter's able work:—"Harmann" (p. 65) or "Haman" (p. 133) for Harman; "Mayon" for "Mayou" (p. 88); "Treacher-Collins" for "Treacher Collins" (p. 96); "Patou" for "Paton" (p. 111) "Thompson" p. (158) or "Thomsen" (p. 256) for "Thomson"; "Trautas" for "Trantas" (p. 162); "Warren Tay" for "Waren Tay" (p. 175); "Brooksbank" for "Brooksbank James" (p. 206); "Sucker" for "Suker" (p. 220); "Hinschelwood" for "Hinshelwood" (p. 233).

The reference to Donald Gunn's communication on "Lacrymal Obstruction in the Young," which is missing from p. 204, should be the *Ophthalmic Review*, vol. xix (1900), p. 31.

SYDNEY STEPHENSON.

CORRESPONDENCE.

"SOME OF THE NEWER REMEDIES IN EYE WORK."

To the Editors of THE OPHTHALMOSCOPE.

PARIS,

le 5 *octobre*, 1908.

MON CHER STEPHENSON,

Dans votre intéressante "*Review of Newer Remedies*," du dernier numéro de THE OPHTHALMOSCOPE, je lis: "*As regards sera, one of the most interesting points insisted upon by Darier is that they are not specific*," et plus loin: "*Teulière's thesis is devoted to proving that sera possesses no specific action.*" Il y a là une erreur d'interprétation qu'on ne saurait laisser passer dans un périodique qui est en train de se classer parmi les premiers journaux du monde ophtalmologique, surtout quand il s'agit d'une question importante comme la sérothérapie. Je vous serais donc bien obligé d'insérer cette rectification dans votre prochain numéro avec la note suivante que rétablit les faits.

Tout à vous,

A. DARIER.

Paraspecific serotherapy at the Heidelberg Ophthalmological Society and at the British Medical Association.

By Dr. A. Darier.
PARIS, FRANCE.

Happe has made in Axenfeld's *clinique* one hundred inoculations of the vitreous body of the rabbit with the pneumococcus. In one-half of the cases he immunised the animals with Deutschmann's serum, or antidiphtheritic serum, or by feeding the rabbits with sterilized yeast (sterile *Dauerhefe*). The other rabbits he used as test animals. Happe arrived at the conclusion that the clinical results attributed to paraspecific serotherapy were not confirmed by the experiments he had carried out on animals. Professor Axenfeld maintained the same thesis at the meeting of the British Medical Association at Sheffield.

The experiments prove one thing only, and that is that laboratory results do not possess in clinical work the value of therapeutical experiment, and that if one had been forced to await for the experimenters to establish the immunising action of Jenner's vaccine, it might have been necessary to wait for a hundred years. Furthermore, the infective nature of tuberculosis had been demonstrated by Villemin long before Koch made his memorable researches. Did v. Graefe discover the curative action of iridectomy in glaucoma by means of experiments on animals?

It is desirable to obtain, when that is possible, the experimental demonstration of results therapeutically observed; but a medical man has no right to deprive his patients of a method of treatment, which has furnished its clinical proofs, under the pretext that the facts have not been confirmed experimentally. Have our most prized remedies been the outcome of the laboratory? Do we understand, even to-day, the mode of action of such specific remedies as mercury, quinine, salicylates, guaiacol, and so forth? Is experiment so omnipotent as is sometimes believed? Immunisation against hydrophobia, tetanus, is recognized by everybody. It will one day be the same as regards those who now doubt the action of vaccine and of antidiphtheritic serum.

von Hippel and Mayweg have replied to Happe and Axenfeld that these questions can be settled only by the result of clinical experience. von Hippel has cured twenty cases of infective ulcers of the cornea by Deutschmann's serum, and Mayweg has had good results in cases treated by antidiphtheritic serum. On the other hand, the experiences of Happe and Axenfeld, numerous though they have been, prove nothing whatever. If they had introduced into the vitreous of animals immunised against diphtheria a culture of the Löffler bacillus, could they have prevented with certainty an abscess of the vitreous body? I do not believe it.

In diphtheria of the cornea the Roux-Behring serum generally arrests infection, but if the corneal ulceration is already deep, perforation is almost inevitable, and should cure result it will be at the price of a large leucoma. All the more in combating a non-diphtheritic corneal ulcer will the Roux serum possess only a stimulant, non-specific action, although one that is very obvious in most cases to a good clinical observer. In the pneumococcal ulcer of the cornea treatment is no more infallible with the specific Römer serum than it is with a paraspecific serum. Trophic disturbances in such cases are apt to render the action of all methods of treatment somewhat doubtful. It has been said that the anti-bodies penetrate the cornea well, but do they penetrate as quickly and as abundantly as in a tissue vascularised as is the iris?

A somewhat wide personal experience teaches me that it is not in ulcers of the cornea that we must seek the proof of the beneficient action of paraspecific serotherapy. It is in penetrating wounds of the eye, and especially in post-operative infections, where one is able to act at the commencement of the process, that we must look for this (see the numerous cases published during the last two years in *La Clinique Ophtalmologique*). And whatever be the result of experiments on rabbits, the clinical facts prove that serotherapy almost always gives a chance of cutting short an infection taken at the beginning.

One thing must be conceded, namely, *the specific action of sera so well established by Pasteur and his school*. But the clinical facts go to show that side by side with the specific action the antitoxic sera have a very marked stimulant, eutrophic action, which is capable of placing the body in a state of defence against micro-organisms other than the one for which the serum has been specially prepared, and that without fear of serious complications. In the presence of a serious ocular infection, the duty of the practitioner should be, after securing the best possible asepsis, to subject his patient to a paraspecific serotherapy, even in the absence of an exact bacteriological diagnosis. If the latter yields a result which implies other indications, the preliminary

injection of serum will not have been useless, since it can only prepare the way for a specific treatment by serum if that be indicated. For example, in pseudo-membranous conjunctivitis, the Roux serum is administered from the first, but should cultures show that the streptococcus is present, the treatment may profitably be completed by injections of antistreptococcus serum. Much in the same way, in some infections it is useful after a preliminary injection of the Roux serum to employ injections of staphylococcus vaccine. Perhaps if they agree among themselves, the experimenters will explain the why and wherefore of this paradox to us in the course of the next ten years! It would be asking too much to expect it sooner.

54, WIMPOLE STREET, W.

SIRS, *October 16th*, 1908.

The last number of your excellent journal contains a review of general anæsthesia as applied to ocular surgery, which deserves very serious attention at the hands of the profession. By a curious coincidence, almost at the same moment that Mr. Sydney Stephenson's words were written, a paper by me dealing with the personal equation in anæsthetics appeared in the *Clinical Journal*, October 7th. I am, therefore, encouraged to write and express in the strongest terms possible my cordial endorsement of the criticism offered in THE OPHTHALMOSCOPE.

Anæsthesia for eye-work is admittedly difficult, so difficult, indeed, that the merest tyro, the casual onlooker, must be impressed, if he is an observer at all, with the depth of narcosis required, the absolute reflex loss that exists, the paucity of guiding signs for the helmsman to act on. How then can one with scanty training and chances only—*longo intervallo*—of practising the art, be other than a novice at the table or the bedside? The whole need is summed up in one word—Experience. Given this, and a great step has been taken in safeguarding the life of the patient.

In regard to the particular narcotic to be employed, I quite agree with Mr. Stephenson, that ethyl chloride is admirable for the purpose; but there, so is chloroform itself, carefully given, and pushed, let me add, at the right moment. When great *fear* is present—a factor of serious import to the administrators—it is wise to go slow, often very slow; the vagus yields grudgingly at times. Personally, I distinguish between *fear* and *fright*; the one is the result, right or wrong, of a reasoned conviction; the other, found only in children, the product clearly of unusual surroundings, or more often due to unpleasant recollections of—shall we say—the surgeon? With the former state, I think it safer to use ethyl chloride in combination with nitrous oxide gas, an admirable mixture which answers very well for short operations in adults, and patients generally above the age of twelve.

I am, faithfully yours,

A. DE PRENDERVILLE.

Senior Anæsthetist to the London Throat Hospital, W. Senior Anæsthetist to the Prince of Wales' and General Hospital, N. Lecturer on Anæsthetics, North-East London Post-Graduate College, N.

To the Editors of THE OPHTHALMOSCOPE.

Dear Sirs,

In his interesting review of remedies, in the October issue, Mr. Sydney Stephenson refers to the decomposition of chloroform under the influence of light and air into phosgene and hydrochloric acid. I would call the attention of your readers interested in the subject to a paper read by Sir Wm. Ramsay, F.R.S., before the Society of Anæsthetists on "Pure Anæsthetics" and reported in Volume II of the Society's *Transactions*, in which he dealt with the disadvantages of the decomposition. Phosgene or carbonyl chloride imparts a disagreeable, pungent odour to chloroform, and is itself, in the presence of moisture, decomposed into carbonic acid and hydrochloric acid.

He pointed out that the change could be prevented by the addition of slaked lime to the bottle of chloroform.

Sir William also said that ether acquired a "sharp" smell, due to the presence of a peroxide of ethyl, and that the formation of this substance could be prevented by the presence of a little metallic mercury; a black powder is deposited, and the "sharp feeling of the ether disappears."

I am,

Yours faithfully,

A. H. PAYAN DAWNAY.

126, Harley Street, W.

October 17th, 1908.

REVIEW OF HERBERT'S "CATARACT EXTRACTION."

To the Editors of THE OPHTHALMOSCOPE.

SIRS,

While thanking Colonel Maynard for his interesting review of my book, I must ask for permission to correct a few of the statements made.

Maynard thinks that few will agree with the statement "it is accepted that infection of the conjunctiva from the nose, by way of the lacrymal passages, does not take place." It will perhaps suffice to refer to p. 95 of Macnab's translation of Axenfeld's "*Bacteriology of the Eye*." The following passage occurs: "Transference from the mouth or nose can only occur by external contact. Under no circumstances can the pneumococcal infection pass through the healthy *ductus naso-lacrimalis* (Bach), nor can they pass up when there is a permeable stricture (Hauenschild)."

There are some small inaccuracies with regard to adrenalin instillation, the section, and atropin instillation, and Maynard is incorrect in stating that peripheral iridectomy is discussed in the book only "as being done *before* the delivery of the lens." And he goes on to explain the object of peripheral iridectomy *after* expulsion of the lens. This is sufficiently discussed on p. 233 of the book.

The reviewer says: "A good deal of ground already covered is gone over again, but perhaps repetition is unavoidable." So far as I am aware, there is no repetition in the book. For instance, perchloride irrigation of the conjunctiva is dealt with in several places. It was convenient and even necessary to sub-divide and distribute the matter written upon this subject. But this did not entail any repetition.

I remain, yours faithfully,

H. HERBERT.

Nottingham,
October 4th, 1908.

NOTES AND ECHOES.

Obituary.

THE deaths are announced of the following American ophthalmic surgeons:—Dr. Horace Miller; Dr. William W. Fletcher; Dr. George E. Stuart; Dr. James A. Lydston; and Dr. Charles Henry Burr. Dr. T. Appleby Stephenson, for many years surgeon to the Nottingham and Midland Eye Infirmary, at Nottingham, died on September 10th last in London, where he had been living for some time in semi-retirement.

* * * *

The late Hermann Cohn.

ON September 11th an interesting ceremony took place in the Jewish cemetery at Breslau, namely, the solemn dedication of a monument erected to the memory of the late Professor Hermann Cohn. Many members of the medical profession attended the last sad ceremony. The monument bore the words selected by Cohn himself:—

"*Augenheilkrankheiten zu verhüten,*
"*betrachtete er als seine Lebensaufgabe.*"

* * * *

Benefactions. THE Pennsylvania Industrial Home for Blind Women, located in Philadelphia, has had 25,000 dollars left to it under the will of the late Annie L. Lowry. The Working Home for Blind Men and Women in the same city has received 1,000 dollars from the estate of the late Jane B. Shain. The Perkins Institution and Massachusetts School for the Blind, Boston, has received 1,000 dollars by the will of Robert W. Lord. By the will of George F. Parkman, 20,000 dollars has been left to the Massachusetts Charitable Eye and Ear Infirmary, Boston.

* * * *

Appointments. DR. BURDON-COOPER has been appointed ophthalmic surgeon to the Bath Eye Infirmary, England. Drs. Daniel B. Smith and Edward S. Lauder have been appointed ophthalmic surgeons to St. Luke's Hospital, Cleveland, Ohio, U.S.A. Dr. Albert H. Purdy has been appointed ophthalmic and aural surgeon to the Misericorde Hospital, Milwaukee, Winconsin, U.S.A. Dr. C. A. Bahn has been appointed consultant on diseases of the eye at the new free clinic of the Louisiana Antituberculosis League. William Grier has been appointed house surgeon to the Glasgow Eye Infirmary, and J. D. Kidd assistant house surgeon to the same institution. Dr. Guiseppe Cirincione (Palermo) has been appointed professor of ophthalmology in the University of Rome. Dr. Angelo Casali has been nominated *privat-dozent* of ophthalmology in Florence, Dr. Alberto del Monte in Naples, and Dr. A. Benedetti and Dr. E. Paparcone in Naples. Dr. L. Grand-Clément has been appointed *chef de clinique ophtalmologique* at Lyons.

* * * *

Bowman Lecture. IT is announced that the next Bowman Lecture of the Ophthalmological Society of the United Kingdom will be delivered in June, 1909, by Mr. Edward Nettleship.

* * * *

Ophthalmological Society. THE *Transactions* of the Society, as readers know, have for the first time in history appeared as separate fasciculi during the past session. It is of some interest to note that 56 members of the Society have taken the fasciculi, as compared with 409 who preferred to receive the volume in its original form. It is pretty clear, therefore, that a majority of the members prefer that technical communications shall have about them somewhat of the flavour and respectability of age before they come to hand. *Chacun à son goût.*

Amalgamation.

THE word "amalgamation" appears to have much the same attraction for some people as that blessed word "Mesopotamia" is traditionally said to have possessed for the old lady. At all events, the question has once again been brought officially under the notice of the Council of the Ophthalmological Society of the United Kingdom, with the result that a sub-committee has been appointed to consider the questions involved, and to report to the Council in due course. It must sooner or later be presented to a general meeting of the members of the Society. The situation, however, has obviously changed since the overwhelming vote against amalgamation recorded some two years ago.

* * * *

Ophthalmia Neonatorum.

MR. ARNOLD LAWSON has been nominated a member of the committee on ophthalmia neonatorum appointed by the British Medical Association. Mr. Lawson will represent the Ophthalmological Society. Dr. George Carpenter has been appointed the official representative on the same committee of the Society for the Study of Disease in Children, now the Section for the Study of Disease in Children of the Royal Society of Medicine.

* * * *

Manchester Royal Eye Hospital.

IT is announced that the Board of Management of the Royal Eye Hospital has been informed by Mr. E. Reid, who is trustee of the Manassah Gledhill Trust, that the sum of £2,000 will be given to the hospital from the trust funds on condition that two beds in the new hospital be named the "Manassah Gledhill beds." The hospital has already one bed endowed by the same trust. The Board has accepted the gift with the condition named, and has passed a resolution of thanks to Mr. Reid for his generosity. In view of the heavy expenditure involved in the extension of the hospital which is now proceeding, this gift of two beds is specially acceptable.—*British Medical Journal.*

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THE

OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

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CONTENTS.

Original Communications—

1. Professor R. Deutschmann.—On Serum-Therapy in Diseases of the Eye 952
2. A. F. MacCallan, M.B., B.C., F.R.C.S.—Ophthalmic Conditions in the Government Schools in Egypt and their Amelioration (*concluded*) 947

Clinical Memoranda—

1. Charles A. Oliver, A.M., M.D.—A brief note upon the Value of the Ophthalmo-Tuberculin Test in the Question of Surgical Treatment of Orbital Disease 940
2. J. Jameson Evans, M.D., F.R.C.S.—The Construction, Technique, and Theory of Rémy's Diploscope 954

Novelties—

1. Leslie Buchanan, M.D.—A New Portable Corneal Microscope ... 957

Review—

1. Transillumination of the Eye.—By Sydney Stephenson 959

Translation—

1. Dr. G. Weil.—On Operations for After-Cataract 971

Current Literature—

I. Sporotrichosis of the Eyelid 973
II. The Diagnosis of Central Colour Scotomata... 978
III. Dispersion of Light in the Crystalline Lens 980
IV. Primary Tuberculosis of the Optic Disc 981
V. The Ocular Complications of Pregnancy 981
VI. Embolism and Thrombosis 983
VII. Tumours 985
VIII. The Ophthalmo-Reaction 990
IX. The Surgical Treatment of Concomitant Strabismus 991
X. Remedies... 998
XI. Miscellaneous 1007

Book Notices 1011

Correspondence 1022

Notes and Echoes 1024

ORIGINAL COMMUNICATIONS.

ON SERUM-THERAPY IN DISEASES OF THE EYE.

BY

PROFESSOR R. DEUTSCHMANN,

HAMBURG, GERMANY.

IN No. 19 of the *Münchener medicinische Wochenschrift* for 1907, I first reported that by means of injecting increasing doses of yeast into the bodies of animals, I had succeeded in obtaining a serum which had proved itself an active remedy in the struggle against various human infective diseases.

Before I proceeded to use this serum as a remedy in human beings, naturally I undertook a series of experiments on animals, the carrying out of which occupied a period of two years. The experiments showed me that the treatment of animals which were infected with cultures of staphylococci, streptococci, or pneumococci, whether through feeding with yeast, or through the injections of the serum obtained from other animals which had been fed upon yeast, this treatment, I say, assuredly made the infected animals more capable of resistance, and, under certain circumstances, cured them. On the other hand, the control animals had to go through the induced disease in all its severity.

These experiments have been fully described in No. 69 of the *Beiträge zur Augenheilkunde*, a work to which those interested in the subject may be referred.* In that place I have also reported the manner of feeding with ascending doses of yeast those animals from the blood of which an active serum was prepared later.

In the intervening period the wholesale preparation of my serum has been undertaken. While I, as long as I prepared the serum myself, obtained it from rabbits, horses are now used and fed with prescribed doses of yeast in a certain definite manner for the purpose of obtaining their blood-serum. At the present time the serum laboratory of Ruete-Enoch, 5, Hermannstrasse, Hamburg, Germany, supplies the active serum, in two modifications: the one, the ordinary "Deutschmann Serum" is the direct animal serum, with the addition of some trikresol, in order that it may keep better: this is in little bottles of 2 c.cm., the usual dose for injection. The other is the same active material of the serum precipitated by a method devised by Dr. Enoch and then again dissolved in water, which bears the name of "Deutschmann Serum E." The latter product, likewise dispensed in little bottles each of 2 c.cm., has the advantage over ordinary serum in that it possesses double the concentration of the last-named. Moreover, it never produces any kind of so-called serum-sickness.

* For review see THE OPHTHALMOSCOPE, 1907, p. 755.

Later on I shall return to the method of using the serum in man, and may first make some remarks upon the results which my serum has so far obtained, as well as upon the opinion of its efficacy, which can now be formed. I may first say that Happe, of Freiburg, has made unsuccessful experiments upon the eyes of animals infected with micro-organisms, with yeast and with yeast-serum. I shall endeavour to explain this difference in our experiments in a special work. I do not need to go further into the matter here, because this question, apart from its scientific aspect, is absolutely irrelevant to any decision upon the important fact of the clinical efficacy of the serum in man. I consider it necessary to mention Happe's work here, because, supported by this work, Axenfeld has given weight to the expression of his doubt of the efficacy of my serum generally—that is, in man also—without ever having used it on a human eye or in any disease whatever. Already at the Ophthalmological Congress at Heidelberg this year the reproach was levelled (and correctly levelled) at him that such a question could be decided only by clinical experience in human beings.

So far as such experiences go at present, they preponderate in favour of the good action of my serum in a whole series of what have been, for the most part, severe eye-affections. Naturally, first of all, I have, as pioneer, tested the clinical efficacy of the serum, and have reported in the detailed work already mentioned, a large number of cases—acute and chronic—of diseases of the eye, in which the serum has rendered excellent service. Generally speaking, they were purulent eye-affections of microbic origin, partly demonstrated, partly inferred, which re-acted to this serum-therapy.

It goes without saying that during the employment of serum every other method of treatment was abandoned. A whole series of cases of so-called hypopyon-keratitis were quickly cured with strikingly little corneal opacity, while it is to be specially emphasised that even cauterisation of the ulcer with the Paquelin instrument or the galvano-cautery was not resorted to. In like manner the serum showed itself especially curative in iritis, whether serous or plastic, as well as in infective processes following wounds of or operations upon the eye.

I have already reported a large number of histories of patients, which illustrate the value of yeast-serum in ophthalmology, and must again refer the reader to the original work for details. But it has not occurred to me to imagine or to affirm that in my serum is to be found a remedy for all eye-affections, certainly or probably of infective origin. Of course, to every sub-sequent investigator cases of disease will come in which the serum will fail, like every other known method of treatment. Yet I do not hesitate to say that at this present moment no more potent remedy in eye-diseases of an infective nature is known to

me, and that I can on that account recommend it unreservedly. This I can do all the more as my serum, even when used in very large doses, has in no case caused the slightest harm to the patient, an experience confirmed by all investigators, even by those who are disinclined to recognise a specific influence upon the eye concerned.

The latter include only Schmidt-Rimpler, who in a small number of patients suffering from most severe hypopyon-keratitis could not demonstrate a curative effect, and Napp,* who reports upon a number of eye-patients whom he has treated in Michels's *Klinik* with my serum. It has been already shown by Zimmermann, in a communication to which I shall refer immediately, that the conclusion which Napp has drawn from his patients, eight in number (which is unfavourable, at least not favourable to my serum) is not justified ; that a portion, indeed, of the case histories directly proves the contrary, *i.e.*, the good effect of the serum. I shall myself take an opportunity in some other place to return to the value and signification of Napp's cases. Both observers named (Schmidt-Rimpler and Napp) must however admit, as already remarked, that no bodily harm whatever has accrued to the patients from the serum treatment.

Darier reported in *La Clinique Ophtalmologique* favourable results from my serum-therapy. He was followed by Schwalbach, who at the meeting of the *Freien Vereinigung der Chirurgen*, Berlin, March 9th, 1908, reported upon a severe case of inflammatory exophthalmos, which was cured in a short time by injections of my serum, without operative or other treatment. In this case the result of the serum was all the more valuable as the other eye of the patient, who was 50 years of age, had a few months before been blinded by the same complaint, which, despite surgical treatment, was followed by atrophy of the optic nerve. For the second diseased eye also an operation had already been proposed, since the optic nerve was exposed to great danger, and the patient had an injection of my serum only in order to leave no remedy untried. Already after twelve hours there was considerable improvement, so that the idea of operation was abandoned, and further injections of serum were administered, with the result that the eye was restored to its normal condition. That the serum was responsible for this happy result is shown by the fact that two relapses promptly disappeared after further injections each of 2 c.cm. of serum. Schwalbach's report ends thus: "We have used the Deutschmann serum in suitable cases in the eye department as well as in the surgical department of the Joseph Hospital since the beginning of this year (about 14 cases) and have had preponderatingly positive results."

An analogous case was treated by Mannhardt (Hamburg) and

* For abstract see present number of THE OPHTHALMOSCOPE, p. 1000.

myself with a most gratifying result. It was an instance of severe metastatic eye inflammation in a male patient, who likewise had the use of one eye only, with endocarditis, apparently of gonorrhœal origin. I was consulted by Mannhardt, as panophthalmitis had set in. Upon my advice, serum treatment was tentatively tried after all other means had been exhausted. The eye recovered perfect sight. Here, also, if further proof were needed that this good result was due exclusively to the injections of serum, it is furnished by the fact that in consequence of a slight relapse of the inflammatory symptoms, due evidently to a premature cessation of the injections, the symptoms again disappeared when injections were resumed.

Additional reports upon the efficacy of the serum have been given by Caravia in the *Medical Record* (New York).* Especially valuable as regards the proof of the efficacy of the serum is the article by A. von Hippel, "A Contribution to Serum-Therapy in Diseases of the Eye" (*Deutsche medicinische Wochenschrift*, No. 27, 1908). After a recitation of his cases, von Hippel concludes with the following words: "If I sum up my 40 cases treated with the Deutschmann serum, I come to the following decision: the serum is to be strongly recommended in severe iritis plastica and in ulcus serpens, in which it apparently renders the use of the galvano-cautery unnecessary when it is employed in doses sufficiently frequent and proportionate to the severity of the cases. It is useful in iritis serosa of a non-tuberculous nature, but ineffectual in severe affections of the vitreous body."

The latest communication, published in *Die Ophthalmologische Klinik*, 1908, No. 13, is by W. Zimmermann. He says: "In cases of pneumococcus ulcer, iritis, and post-operative infections, the serum appears, when used early, to be of undoubted use, and whoever saw a single case of florid infection after cataract extraction run its course, as we saw, would never give up the remedy by reason of the unfavourable criticisms to which it has been subjected. Much depends upon the timely employment of the serum, the prophylactic use of which is worth consideration, especially in cases of perforated wounds of the eyeball, where sepsis may supervene, in cataract operations in decrepit individuals, and in the presence of other causes in which infection is to be suspected. Under any circumstances, the harmlessness of the remedy (with which our experiences agree) should encourage us to make a thorough trial of it, even although our knowledge of the theoretic explanation of the action of the preparation is far from complete. From von Hippel's experiences alone, it is evidently better to inject a day too early than an hour too late."

All the observations published up to this time go to show that infective diseases of the eye are influenced favourably by

* For abstract see THE OPHTHALMOSCOPE, December, 1908, p. 1000.

my serum. Again, von Hippel, replying to Römer in the course of a discussion on the present position of pneumococcus-therapy, says: "Upon the ground of thorough clinical investigation carried out for some time, I have convinced myself that the Deutschmann serum can influence favourably severe cases of ulcus serpens in man, so that the employment of the galvano-cautery is rendered unnecessary, while the cicatrices that remain are slighter than those which follow the ordinary methods of treatment: this clinical observation is assured." I may add that according to my clinical experience, as well as to that of Schwalbach, Zimmermann, and Mannhardt, my serum is able to influence favourably severe cases of iritis, in addition to purulent affections of the eye, whether spontaneous or post-operative. I should not omit to state that the serum has proved its claim, not only in diseases of the eye, but also in the treatment of human infective diseases generally. It has shown itself to be an excellent adjuvant remedy in the fight against pneumococci, staphylococci, streptococci, and their toxins. It not only influences favourably the general health of the patients thus affected, but certainly shortens the course of the infection. This action reveals itself in several ways—such as, prompt reduction of the temperature by 2° or 3° after the injection of a single dose of from 2 c.cm. to 4 c.c.m., the early crisis, and, lastly, the healing of inflammatory processes. A number of such observations made in cases of pneumonia, scarlet fever, measles, septic throats, and pyæmic general infections are at the disposal of anybody who cares to refer to them.

I may now make some quotations from a work by Wolff, of Cleve (Prussia) entitled "Deutschmann's New Remedial Serum in Veterinary Practice," in which he describes the good results he has obtained by treating distemper in dogs with the serum. He says: "If the good results so far obtained by serum are confirmed, and I have no reason to doubt that they will be, then a considerable advance will have been made in the treatment of distemper."

The actual trial of my serum on human beings, both healthy and diseased, has shown that if employed in the right way, it exerts no harmful action, while it often is capable of producing a surprisingly favourable result in diseases of the most diverse nature. Although doses ranging from 4c.cm. to 8c.cm. produce in healthy individuals merely a feeling of increased well-being, the same doses in feverish patients reduce the temperature by 2° or 3°. In acute infectious disease it was found that while a reduction in temperature followed the first injection, the temperature rose again next day, to fall once more without a further injection, eventually to remain stationary.

With regard to the doses of the serum, it is given to feverish patients according to the height of the fever and the severity of

the affection, as well as according to the age of the patient. In children, doses of 1 c.cm. to 1½-2 c.cm. are injected; in adults, 2, 4, 6, and, finally, 8 c.cm. twice, thrice, or oftener weekly, according to the effect obtained. The doses are then slowly reduced. In non-feverish patients, and to this class belong most eye cases, the dose must be arranged according to the severity of the disease. The treatment must not be lengthened out by a series of small doses, but should begin with a large one, which must be reduced only when a decided improvement has taken place; 2 c.cm. to 4 c.cm. E. is evidently only a medium dose for an adult, 2 c c.m. of this solution being the smallest commencing dose. In any case large doses are certainly necessary to battle effectually under certain circumstances with a severe eye disease of an infective nature, and a sufficiently high one can often decide the fate of an eye, as it can, indeed, the fate of the whole organism. A large proportion of the negative results might certainly be traced to an insufficient dose of serum, and since with the serum, especially with the modification E, the slightest harm cannot be done, so massive doses are not only permissible but positively indicated.

The *technique* of the injections is very simple. Tht serum is best injected intramuscularly, in the anterior chest wall or lateral abdominal wall. If, for any reason, intramuscular injection be impossible, then the remedy can be introduced *via* the rectum, although the action is not then so assured, and the dose must be increased, by reason of the uncertainty of sufficient absorption by the rectum. The polyvalency of my serum, described in the foregoing lines, might cause surprise as regards the positively proved specificity of the anti-material, and, although my serum is obtained in quite a different way from all other sera, the explanation of the polyvalency of the same presented great difficulties with regard to its trustworthy action. Every other serum is obtained through the microbes concerned or their products, against which later on the serum of the animals treated will be active, as it becomes incorporated in the blood-passages. However, I feed the animals upon living yeast-cells; thus in the digestive tract of the animals chemical processes are set up, the products of which are carried to the blood with the aid of the lymph-stream.

Thus, the experiments made with my serum show that it is not bactericidal, works non-antitoxically, and cannot opsonize even the micro-organisms against which it acts. I myself demonstrated, that, with the animals fed upon yeast, as a final result of complicated chemical processes in the digestive tract, a stuff is thrown into the circulation, which when the animal organism is bacterially infected so that its cells are obliged by the throwing out of amboceptors to form antibodies of a specific nature, brings fresh nourishment and fresh energy to these active cells, so that

they cannot be injured by the production of specific antibody. This stuff, with the serum of the fed animals, is brought into the human organism by means of injections, there to become active in a way similar to that just described against microbic disease.

In No. 4 of the work issued by the Royal Institute for Experimental Therapy at Frankfort, A./M. (Ehrlich), Professors Neisser and Guerrini have communicated the results of an investigation of serum in a paper entitled "Opsonine and Leucostimulation." The result showed that the Deutschmann serum, although unable to opsonize staphylococci used for the experiment, was able to strengthen the phagocytosis. This strengthening action, according to the reports of both authors, must have been distinct, if the staphylococci were sensibilised with immune serum before the addition of the Deutschmann serum. The experimental figure-proof follows, I cite here under "sensibilitating with 5,000 reduced immune serum the phagocyte number, after the addition of active normal horse-serum (1 : 100), 7·9 ; of Deutschmann serum (1 : 100) 13 ; Deutschmann serum (1 : 1,000), 9·9."

According to this, Neisser and Guerrini include the Deutschmann serum among the leuco-stimulants—that is, among the things which are able to stimulate the strength of the leucocytes, and are of the opinion that it is possible that this action extends to the nucleins.

With this the possibility of an explanation of the polyvalency of my serum might be admitted without anything further, and it would further bring it easily into agreement with the view, which I had myself formed before this experimental reason from the Ehrlich Institute was known to me.

The serum treatment forms a permanent support of the natural curative process in the human organism, a support in the battle against microbes which have forced an entrance. It already results that with improvement commencing one must not break away at once from serum treatment, but continue it for a shorter or a longer time according to the severity of the disease, in order to avert a possible exhaustion of the cells preparing the antibodies.

I may conclude by asking my colleagues to settle the diseases in which my serum is able and those in which it is not able to render aid. The harmlessness of the serum amply justifies experiments upon the most extensive scale. J. F. S.

OPHTHALMIC CONDITIONS IN THE GOVERNMENT SCHOOLS IN EGYPT AND THEIR AMELIORATION.

BY

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Concluded.

Part III.

Statistics.

(i) *Incidence of trachoma in its relation to school years.*—Four complete examinations of all the pupils were made by ophthalmic surgeons during the school year 1907-1908; at each of these examinations full notes were taken of each pupil's ophthalmic condition.

Out of 485 pupils in the school at the beginning of the school year only 21 were found to be absolutely healthy, the remainder 464, or 95·67 per cent., being infected with trachoma.

The stages of trachoma (trachoma I, trachoma II, trachoma III and trachoma IV, *vide* Part II of this report) in relation to school years are shown in the accompanying table:—

TRACHOMA.

	Healthy.	I.	II.	III.	IV.	Total.
Year I	6	15	68	29	2	120
,, II	6	26	69	34	3	138
,, III ...	4	26	53	60	2	145
,, IV ...	5	11	21	42	3	82
Totals ...	21	78	211	165	10	485

It is extremely interesting to see the way in which the percentage of trachoma II, the most severe stage of the disease, diminishes as the pupils grow older, illustrating what I have said with regard to the natural cure of trachoma, even in the absence of treatment:—

Percentage of trachoma II in school years.

Year I ... 56.6 per cent.
,, II ... 50 do.
,, III ... 36.5 do.
,, IV ... 25.6 do.

Also as might be expected as a corollary to the above facts,

the percentage of trachoma III increases markedly, at any rate in the third and fourth years :—

Percentage of trachoma III in school years.

Year I	...	24.1 per cent.
„ II	...	24.6 do
„ III	...	41.3 do.
„ IV	...	51.2 do.

Trachoma IV is a stage which is comparatively rarely reached by school boys, only ten out of the whole school having attained to it.

If pupils are infected after their admission to the school, being previously healthy, it would be found that the proportion of healthy and trachoma I pupils was much larger in the first year than in the second, third, and fourth years ; this however, is not the case.

Percentage of healthy and trachoma I pupils.

Year I	...	17.5 per cent.
„ II	...	22.4 do.
„ III	...	20.6 do.
„ IV	...	19.5 do.

Nevertheless, as will be seen later, there were 15 pupils, at first classed as healthy, who during the school year became infected with trachoma ; these, however, were not all of the first year, and may have acquired the disease at home or, at any rate, out of school hours.

(ii) *Incidence of trachoma in its relation to degrees of vision.*— In this table the degrees of vision are arbitrarily divided into :

(a) Normal vision 6/6 in each eye, a correction by glasses of ametropia of not more than + or — 6D. being allowed.

(b) Fair vision combinations of 6/6, 6/9, and 6/12 (other than 6/6 in each eye), correction by glasses of ametropia not greater than + or — 6D. being allowed ; also 6/6 in one eye and less than 6/12 (including no perception of light) in the other, correction by glasses of ametropia not greater than + or — 3D. being allowed.

(c) Bad vision. Other degrees of visual acuity not already classified.

TRACHOMA.

Vision.	Healthy.	I.	II.	III.	IV.	Total.
Normal ...	7	31	19	37	1	85
Fair ...	12	32	96	72	6	218
Bad	2	15	96	66	3	182
Totals	21	78	211	165	10	485

There appears to be some relationship beween severe trachoma (trachoma II) and vision. At any rate, it is seen that there is a much larger percentage of trachoma II among bad vision pupils than among the normal and fair vision pupils.

Percentage of stages of trachoma calculated with reference to total numbers of each class of vision :—

	TRACHOMA.				
Vision.	Healthy.	I.	II.	III.	IV.
Normal ...	8·23	36·47	22·36	31·76	0·01.
Fair ...	5·50	14·67	44·03	33·02	0·27
Bad ...	0·01	8·24	52·74	36·26	0·02

From this the special influence of trachoma II in producing deterioration of sight is seen. As might be expected, there are comparatively few cases of bad vision among the pupils with healthy or but slightly defective conjunctivæ.

(iii) It has been seen in the last paragraph (ii) that out of 485 pupils there were 85 only with normal vision, and boys were reckoned as endowed with normal vision even though glasses were necessary for them to attain to 6/6 in each eye.

Therefore, only 17·5 per cent. had normal vision.

Four hundred pupils had sub-normal vision, or 82·5 per cent. of the whole school ; the causes have been classified as follows :—

Corneal opacity	110
Hypermetropia, including hypermetropic astigmatism	152
Myopia, including myopic and mixed astigmatism	128
Result of disease in iris	3
lens	3
fundus	1
central nervous system ...	3
	400

Of the 280 cases classed as ametropia 73 were atropinised at different times with a 1 per cent. solution of atropin three times a day for five days and retinoscopy was performed on the sixth day. Of the remaining 207 cases the direction of the shadows in the unatropinised eye was taken as a rough guide to the variety of ametropia.

An examination of the corneæ by focal illumination in the dark-room showed that 266 had both corneæ clear; of the other 219 :—

One cornea clear, the other nebulous	92
Nebula of both cornea	116
Adherent leucoma	11

(iv) *Other conditions of interest* :—

(a) Trichiasis.—Nineteen pupils had trichiasis in one or both eyes; two other pupils had been operated upon for trichiasis, in one of them the operation had been performed with so little skill that lagophthalmos had been produced, and he is now unable to close either eye.

(b) Ptosis.—2 cases.

(c) Squint.—41 cases; of which 25 were convergent and 16 divergent.

(d) Nystagmus.—3 cases.

(e) Blindness (pupils were considered to be blind who could not count fingers at a greater distance than one metre), 8 cases. The causes were as follows :—

(i)	Ulcer of cornea, complicated by iritis.
(ii)	„ „ resulting in staphyloma.
(iii)	„ „ „ shrunken globe.
(iv)	„ „ „ adherent leucoma.
(v)	„ „ „ total opacity of cornea.
(vi and vii)	Traumatic cataract.
(viii)	Amblyopia.

(f) There were no cases during the year of Spring Catarrh or of "*Fausse Granulation.*"

Part IV.

Means adopted at Tantah School with a view to the improvement of the ophthalmic conditions described in Chapter III.

The staff found to be necessary for the work has been an ophthalmic surgeon, a clerk, and a trained attendant, and during the past year they have been employed exclusively for the work of the school.

This work may be divided into several classes :—

(a) Detailed examination of the eyes and sight of every pupil at the beginning and end of the school-year, and the compilation of the statistics given in Chapter III.

(b) Prophylactic treatment for all pupils exhibiting the most severe form of trachoma, *i.e.*, trachoma II. This has been effected by the daily instillation of antiseptic drops into the eyes of all pupils with trachoma II. It indicates to the subjects of this stage of trachoma that they are considered to be in a condition in which treatment is especially advisable. The pupils have also been given to understand that this treatment, although

not without some benefit, is by no means thorough, and that further treatment can be obtained out of school hours, if desired.

(c) Effective or voluntary treatment after school hours. This is carried out on demand of the pupil, and includes whenever necessary, the performance of minor operations under chloroform, for which permission has been previously obtained from the pupil's parent or guardian.

(d) The examination under atropin of scholars who, having deficient vision, are likely to have their sight improved by the prescription of spectacles.

(e) Information is given to guardians when their wards have such a diseased condition of the eyes that operative procedure (other than for trachoma which is carried out in the schools free of charge) is advisable.

(f) The head-master can send any day to the ophthalmic surgeon any pupil who develops a discharge from his eyes or who suffers from headache.

Part V.

Results of Treatment.

(i) Two complete examinations of all the pupils were made by me, one at the beginning and the other at the end of the school year, and the full clinical notes prepared by the ophthalmic surgeon in charge of the work, Dr. Abdul Aziz Fahmy el Aguizy, were verified.

(ii) Prophylactic treatment was carried out daily for the 211 pupils with trachoma II. As I do not consider that it has any real influence on the disease, these pupils have been counted among the untreated.

(iii) Effective or voluntary treatment was carried out for 149 pupils at their own request.

The following table shows the treated and the untreated in the various years :—

	YEARS.				
	I.	II.	III.	IV.	Total.
TREATED, Improved ...	32	44	44	10	130
Not improved	8	4	5	2	19
UNTREATED, Improved ...	11	12	10	6	39
Not improved	57	66	85	62	270
Total ...	108	126	144	80	458
Transferred to other schools ...					18
Absent at last examination ..					9
Total number of pupils ...					485

It is therefore seen that of the treated cases 87·2 per cent. showed improvement at the end of the school-year, while of the untreated cases only 5·9 per cent. showed improvement.

Of the 130 pupils who exhibited improvement 68 had been operated on in the ophthalmic room (63 under the influence of chloroform and 5 under the influence of cocain).

(iv) 73 pupils were examined for errors of refraction, after thorough atropinisation, by retinoscopy and subsequent careful subjective testing.

The results obtained were as follows :—

Spectacles ordered and being worn regularly ...	25
Spectacles ordered found unsatisfactory	2
Spectacles ordered but not obtained	31
Examination made but no spectacles ordered (not found to be useful)	15
	73

It has been found extremely difficult to get frames to fit some of the pupils, owing to the extreme length of the eyelashes, often reaching 11 millimetres, necessitating the adjustment of the lenses at a considerable distance in front of the cornea.

(v) Notices were sent to the guardians of 12 pupils informing them that operations for the cure of trichiasis were advisable.

In 4 cases operations for iridectomy, and in one case an operation for cataract, were advised, but in no case was the advice complied with.

PART VI.

It has only been by the cordial co-operation with me of the head-master, Mahmoud Effendi Rouchdi, and the painstaking labour of the ophthalmic surgeon, Dr. Abdul Aziz Fahmy elAguizy, that I have been able to compile the forgoing statistics.

CLINICAL MEMORANDA.

A BRIEF NOTE UPON THE VALUE OF THE OPHTHALMO-TUBERCULIN TEST IN THE QUESTION OF SURGICAL TREATMENT OF ORBITAL DISEASE.*

BY

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WITHIN the past six months three cases of localized orbital disease of uncertain ætiology have been submitted to my judgment as to the advisability of operative procedure. Each was given the benefit of reaction-to-tuberculin studies with which I have

*Read before the International Congress on Tuberculosis held in Washington, D.C., U.S.A., in 1908.

been much occupied of late. The results, in every instance, were those of undoubted positive reaction.

Appropriate tuberculin therapy was applied in each case, with the result that the signs and the symptoms of the orbital disturbance in two of them so greatly subsided in four and a half months' time and four months' time respectively, as to have the condition for which the patients came, considered as practically well; while the third, which is under active treatment at the present time (June, 1908), is rapidly undergoing local resolution. The health of all of the cases has remarkably improved, and a not long postponed general recovery is expected.

Without entering into a detailed account of the cases in such a brief communication as this, and reserving a full report of them for a more extended article upon the subject, I herewith give the following reasons which induced me to resort to the plan, and offer a few conclusions regarding the usefulness of the method in this particular type of disease.

The reasons, briefly stated, were, that having previously noticed that the ophthalmo-reaction in many of my ophthalmic cases was more pronounced in young comparatively sthenic subjects with the less marked and the more uncertain types of tuberculous lesions of the corresponding eye and its adnexa, and that such reaction could be obtained with even the largest percentages of reaction-material without any damage to the eyeball, I came to the conclusion that in such cases, the test must prove itself of value not only in regard to diagnosis, but in reference to both prognosis and method of therapy.

As a result, I offer the following conclusions in support of the method:

I. Ophthalmo-tuberculin tests, judiciously used, are of value in the determination of tuberculosis of the corresponding eye and its adnexa, particularly in primary infections of the same, and should be made in every doubtful case.

II. Ophthalmo-tuberculin tests properly employed in such cases, serve not only for purposes of ætiologic diagnosis, but are of importance in the determination of methods of treatment for the removal of the local disease.

III. Ophthalmo-tuberculin tests carefully made, should form a part of the routine study employed in every case of doubtful disease of the eyeball and its adnexa before any proposed operative measures are resorted to.

IV. Ophthalmo-tuberculin tests, conscientiously applied and giving positive determinative results, should, whenever possible, be followed, in part or in whole, by tuberculin therapy.

THE CONSTRUCTION, TECHNIQUE, AND THEORY OF RÉMY'S DIPLOSCOPE.

BY

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THE essential parts of Rémy's diploscope consist of a horizontal rod 120 cm. long and a perforated disc 9 cm. or more in diameter, the larger size being necessary when the number of holes in the disc exceeds six. At one end of the rod, a card carrier is fixed and at the other a lens holder or chin rest. The disc, which is perforated by a series of holes (18 mm. in diameter), some 60 mm. apart, others 30 mm. apart, is placed over the centre of the rod, *i.e.*, 60 cm. from each end of the rod. Except in small models for reading and in large extemporised models for special cases, the disc is fixed at the distal end (next the card carrier) of a metal cylinder 20½ cm. in length. The proximal end (next the lens holder) of this tube is open except for a couple of flat metal bars 2½ cm. in diameter, which can be dropped in a superimposed position vertically across the opening or moved separately to one or other or both sides or moved out of the way altogether. The rod and its fixtures and the disc and its cylinder are fixed on an adjustable and firm stand. The test cards generally used bear four letters horizontally arranged and 60 mm apart, or two vertical letters 102 mm. apart. The letters may be replaced by figures, drawings, or coloured stripes, to suit the requirements of special cases.

Rémy's latest model has 6 holes in the perforated disc and the card carrier takes 3 cards horizontally at once, and there is no occasion to employ vertical cards, as the letters in vertical series on the 3 cards serve the purpose. The proximal end of the rod is fitted with a couple of lens holders.

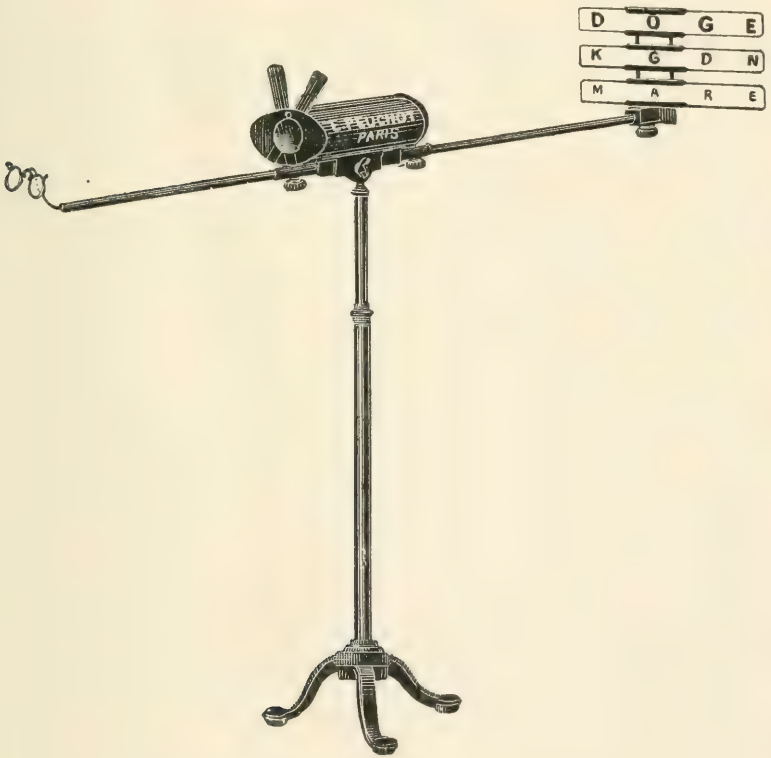
The disc can be rotated so that the holes can be used in a horizontal position or at an angle. Each hole is provided with a hinged obturator so that the holes not required may be closed.

When the letters on the cards are observed through 2 holes arranged horizontally, the holes in the disc are doubled owing to the production of a physiological crossed diplopia and with the openings 60 mm. apart the patient sees one of the 4 letters through each hole if he has binocular vision. The 1st and 3rd letters are seen by the right eye and the 2nd and 4th by the left. If letters such as K O L A or D O G E are used the consonants are seen by the right eye and the vowels by the left.

Absence or suppression of vision in one eye reduces the number of holes and letters seen to two and the defective eye is immediately indicated by the missing letters.

The routine tests employed are three in number:

(i) The disc is rotated so that two holes, 60 mm. apart, are placed horizontally. The other holes are closed. A card with four letters, say K O L A, is placed in the middle card carrier. In normal binocular vision the four letters are seen at once, the visual axes converging on a single point on the card generally



between the letters O and L. Any failure in this respect abolishes binocular vision, as in suppression of vision in one eye or in simultaneous (not binocular) vision. Simultaneous vision by each eye is indicated by diplopia or displacement of the letters. It is a state of vision which must be attained to in cases of suppression before the diploscope can be successfully applied in the treatment of squint.

In normal subjects all kinds of deviations can be demonstrated on the diploscope by means of a set of prisms. A prism apex in before the right eye produces the same effect as a divergence,

and as the strength of the prism is increased, the K and L appear to move to the left until eventually the letters are seen as K L O A. In this process the L and O, at one stage, get superimposed and it is curious how one or other of these letters will suddenly disappear.

This demonstrates conclusively the possibility of suppression (neutralisation) in normal subjects. When the prism is placed apex out before the eye, the effects are reversed and a convergence is represented, the letters eventually appear as O A K L.

In any case of convergence or divergence the prism which corrects the displacement of the letters is the measurement of the ocular displacement. Rémy has graphically represented these facts by means of his so-called "diplogrammes."

(ii) Test with three letters, *e.g.*, D O G, all the openings are closed except two holes which are 30mm. apart, and are placed in the horizontal medium position. Normally the centre letter is seen by both eyes, the D by the right eye, and the G by the left. Any deviation of the ocular axes is indicated by doubling of the O. This is a good test for binocular vision. The greater the deviation, the greater is the separation of the D O from the O G, unless one pair be suppressed. In both I and II the terminal letter on either side may be excluded by lowering one of the bars obliquely in front of the cylinder

(iii) Test with vertical letters, 102mm. apart. A separate card is used in the old model, and in the new model horizontal cards in the top and bottom card carrier, and the vertical letters used.

Two holes which are 60 mm. apart are used and the disc is rotated so that they are placed obliquely in the position of the clock figures of 1 and 7, or 11 and 5.

When the ocular muscles are balanced, the letters appear vertically one above the other, and any deviation of the axes is indicated by displacement of the bottom letter to right or left in relation to the top letter. When the oblique line from one letter to the other is parallel to an imaginary line between the holes there is convergence; when these lines are perpendicular one to the other there is divergence.

In the new model, tests II and III, can be conveniently applied by having three horizontal cards in position, the six holes arranged thus :— $^{1}O\ O^{2}$ $^{3}O\ O^{4}$ $^{5}O\ O^{6}$

The letters seen through 3 and 4 give test II, and those vertical letters seen through 1 and 6, or 2 and 5 when the bars are placed vertically in front of the tube, give test III.

There are numerous other tests with letters varying from nine to one in number. In a brief note of this sort, however, it is impossible to give an adequate account of the varied practical

applications of the diploscope, but it can be seen that it may be advantageously used for :—

1. The demonstration of certain physiological peculiarities of vision, *e.g.*, diplopia, suppression, etc.
2. Exposure of simulation in medico-legal and other cases.
3. The demonstration and measurement of axial deviations of the eyes.
4. The orthoptic treatment of squint.
5. Control in the choice of glasses for ocular deviations.

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NOVELTIES.

A NEW PORTABLE CORNEAL MICROSCOPE.

BY

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Of recent years there has been a decided tendency to look more closely into the appearances of eyes in disease, and, to assist in the accomplishment of this object, various instruments have been designed which give a magnified image of more or less perfect colour and form. The best of these microscopes are large stand instruments, which give a high magnification, require great exactitude of adjustment, and are not available for use except under special conditions. As these take up a certain amount of floor-area and cost more than the average ophthalmic surgeon cares to expend, several smaller and less perfect, but more portable, instruments have been devised to give a less high magnification. Most of these have some disadvantage, and the instrument here described and illustrated has been designed with the object of filling the rôle of a stereoscopic microscope of low power which is perfectly portable.

In putting together such an instrument several considerations required careful attention :

(1) The instrument must give a true stereoscopic image which is achromatic, erect, and enlarged three or four diameters ; (2) it must be easily adjustable to various sizes of interocular distance and head ; (3) it must allow of sufficient working space

* The maker of the Diploscope is :—Mme. E. PEUCHOT, 31, Quai des Grands Augustins, Paris (VIe). The appliance can be obtained through Messrs. F. Davidson and Co., 29, Great Portland Street, London, W.

between it and the eye to be examined (say, three inches); (4) it must allow the observer room to see below it, to pick up or to adjust instruments, etc.; (5) it must be steady and remain fixed to the observer's head whilst he is moving; (6) it must not weigh too much; and (7) it must not cost too much.

The optical arrangement ultimately fixed upon as most suitable was a modification of Brücke's lens, and, with the kind assistance of Mr. Horace Beck, of Messrs. R. & J. Beck, Ltd., the instrument has been made up as figured.* So far as can be seen, it answers in a wonderfully satisfactory manner all the requirements stated above, and in use in the clinique has proved exceedingly serviceable. It gives an achromatic and stereoscopic image, and magnifies just over three diameters. It is made up with good achromatic object glasses and the tubes are inclined to one another at such an angle that the least

amount of prism possible is used. The tube on the left side can be moved sideways and clamped in adjusting for interocular distance and the prisms on both sides can be rotated to assist the convergence in certain cases. The two brass tubes are fixed to an aluminium forehead block which is strapped to the head. The aluminium block is furnished with two leather pads for the forehead and an air pad for the nose, to ensure steadiness and comfort. The working distance is about three inches, and the observer has plenty of room to see below the instrument. The weight of the instrument, without electric attachment, is only a

*Messrs. R. & J. Beck, Ltd., Cornhill, London, E.C., the makers, will be pleased to show the instrument and to answer any enquiries.

few ounces, and the price is two guineas. As regards lighting, Mr. Beck has kindly arranged that an electric fitting can be supplied, attached to the instrument and worked by a storage or dry-cell battery, at an extra cost of 15/6. It may be added that the field is very flat, and is large enough to take in the entire cornea or iris. It is unnecessary to attempt a description of the cases in which such an instrument is of service, but it may be stated that the writer has found it a great assistance in removing foreign bodies from the cornea and in observing fine changes in either the cornea or the iris.

Since the above was drafted the writer has found that a single tube instrument was formerly used under the name of "*loupe composée d'oculiste*", but he has not been able to find it described in medical literature.

REVIEW.

TRANSILLUMINATION OF THE EYE.

BY

SYDNEY STEPHENSON,

LONDON, ENGLAND.

TRANSILLUMINATION (or "Diaphanoscopy" as it is now often called) is a method of physical diagnosis that has been curiously slow in gaining popular recognition from ophthalmic surgeons. Yet the principles involved have been known for a good many years. In 1884 O. Lange[1], then of St. Petersburg, described the use of transillumination in the diagnosis of intra-ocular sarcomata. He allowed light from an ordinary gas-flame, concentrated by means of a lens, to fall upon the sclera, the pupil being widely dilated by means of atropine. In one case Lange found that light, when directed upon the sclera which corresponded with a retinal detachment, caused by a sarcoma of the choroid, failed to illuminate the pupil. In another case, where detachment of the retina had followed extraction of cataract, the reverse took place, and the accuracy of the diagnosis reached by these means was subsequently shown by spontaneous re-attachment of the retina. A few years later P. H. Mules[2], then of Manchester, England, in the course of a communication on "Tumours of the Ciliary Body," pointed out that a bulging in the ciliary region produced by a neoplasm might be differentiated from an ordinary staphyloma by projecting a small but powerful beam of light on the protrusion. In the former case the light could not enter the eyeball, whereas in the latter it would be readily perceived in the interior of the globe. The method, Mules thought, was of value only where the tunics

had become much thinned. It had enabled him to reach a correct diagnosis in one case of staphyloma. In a foot-note Mules pointed out that Dr. Herman Knapp had informed him that he had "published this method some years since." The reviewers' recent enquiries from Dr. Knapp, however, have failed to elicit any reference in literature to his earlier use of this primitive method of transillumination.

In 1888 v. Reuss[3] recognizing the value of transillumination, devised a special lamp for its more ready application. His apparatus consisted of a tiny glow lamp, actuated by a chromic acid battery of five to eight elements, enclosed in a metal case, and provided with a water-jacket, in order to prevent overheating. Leiter[4] modified v. Reuss's rather complicated lamp by employing a glass rod to conduct the rays of light, and thereby doing away with any necessity for the water-jacket.

The invention, however, appears to have attracted little attention until thirteen years later, when Leber[5] described the well-known hammer-shaped instrument that goes by his name. It is shown in figure 1, and consists of a small electric glow lamp, enclosed in a metallic receptacle. A short rod of solid glass, sheathed with rubber, is in contact with the lamp, almost all the light from which is conducted along the rod to the free edge of the latter.

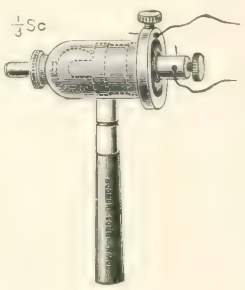

Fig. 1.

The glowing end of the rod, when placed in contact with the conjunctiva overlying the sclera, will cause the pupil to glow more or less brightly. The pupil need not be dilated, and the instrument heats so slowly that the examination can be made without inconvenience to the patient.

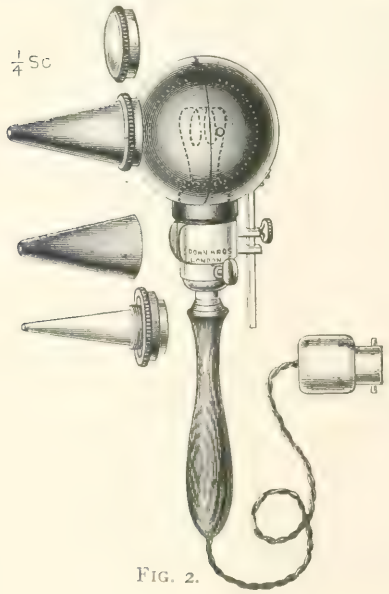

Fig. 2.

In the following year Sachs[6] also devised a lamp for transillumination. Details are shown in figure 2. Rochon-Duvigneaud[7] followed hard upon the heels of Sachs. He described an appliance for diaphanoscopy which essentially consisted of a small electric lamp, worked by an accumulator of 10 to 20 volts, enclosed

in a horn box, provided with a glass cone, 5 to 6 centimetres in length (figure 3). The light could be transmitted through the sclera (without heat) by the direct application of the glass cone.

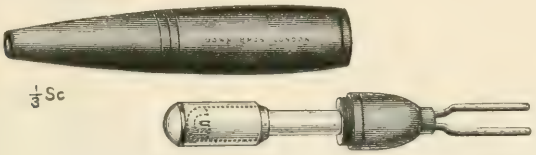

Fig. 3.

Recently, Lange[5] has invented a new diaphanoscope, which appears to present some advantages over the forms so far described. It is depicted in figure 4. It consists of a hard rubber cylinder, 5 cm. long by 2·5 cm. in diameter, containing at one end a small electric glow lamp of 10 volts. The end of the rubber cylinder is capped by a nickel clasp, into which is fixed a glass rod, 5 cm. in length. The free end of the rod is slightly curved and terminates in a point, 2mm. in diameter.

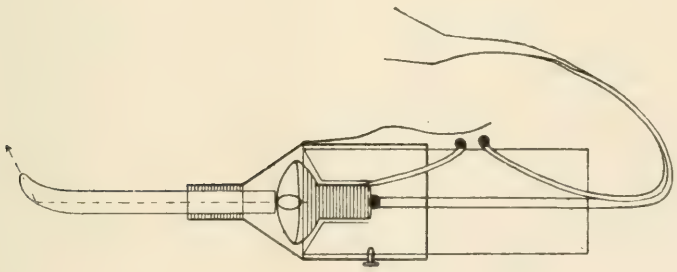

Fig. 4.

The construction of the rod permits of its being applied far back over the globe, which is not the case with some of the other instruments, notably with that of Leber. A suitable key, shown in the figure, permits the current to be controlled. The instrument (made by Ernest Schiller, 34, Schützenstrasse, Braunschweig) costs thirteen marks. It is, in the reviewer's opinion, a most efficient appliance.

The latest transilluminator is that of H. V. Würdemann[9]. As shown in figure 5, the entire instrument is not much larger than an ordinary fountain-pen, and it is claimed that in actual use it does not become hot, as most of the other instruments are apt to do, after a few moments employment. In his last communication Würdemann[10] claims that his model "may be used for ten minutes or more before it becomes too warm."

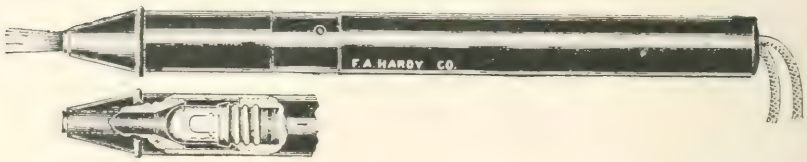

Fig. 5.

On the other hand, according to the same writer, "the Leber instrument gets so hot in a couple of minutes that it will burn the skin, and the Sachs' does not stay cool even as long."

A 5 c.p. glow lamp is arranged at one end of the Würdemann transilluminator, and attached to the lamp is a lens, in contact with which is a 5 mm. glass rod, about three-fourths of an inch in length. Almost all the light is thus focussed in the glass rod, and from thence, when placed in a suitable position, it is projected as a beam of light through the eye.

With the advent of the Lange and the Würdemann transilluminators, diaphanoscopy has entered upon a new and most practical era. The method appears likely before long, now we have these convenient instruments at our disposal, to find a place in every clinic and a use in many conditions of the eye. Indeed, it is obvious that nobody can now afford to neglect the diagnostic advantages of transillumination.

Diaphanoscopy is best carried out in a room from which all extraneous light has been carefully excluded. The ordinary dark-room used for ophthalmoscopic examination answers quite well. The patient's pupil should be widely dilated by the use of some mydriatic. The glowing end of the instrument may be applied to the skin of the upper or lower lid, or, better, directly to the ocular conjunctiva, first rendered anæsthetic by the local use of alypin, cocaine, or novocaine. It is claimed that the smooth end of Würdemann's instrument may be applied direct to the scleral conjunctiva without the preliminary use of cocaine.

In either case the surgeon stands in front of the patient, and watches the pupil intently. Fridenberg[14] insists that "the observer should look into the pupil in a line with the patient's gaze and not directly from in front as is usually done." In normal eyes the pupil lights up with a bright glow whenever the diaphanoscope is placed over the sclera, an appearance to be seen even when the crystalline lens is opaque, as in ordinary mature senile cataract. Even dense corneal deposits scarcely impair the illumination (Fridenberg[14]). It is sometimes a good plan to separate the lids with the fingers and to apply the instrument oneself, meanwhile getting another observer to watch and to report upon the pupillary phenomena. All accessible parts are in turn subjected to the glowing rod, the eye being turned in this or in that direction for the purpose, and the pupillary glow thus elicited in the different parts of the eye is compared as to brightness. If carried out with even ordinary gentleness, the application of the transilluminator is practically painless. It is of some consequence, however, to assure oneself that the glass rod is not becoming uncomfortably hot, as may be readily done by applying it from time to time to the delicate skin on the back of the metacarpal bone of the index finger.

There are differences as regards the readiness with which diaphanoscopy can be carried out, depending, in the main, upon the anatomical configuration of the orbit. Babies' eyes are especially difficult. Indeed, a general anæsthetic must be given before transillumination can be carried out in children generally. The most obvious limitation, however, has reference to the amount of the eyeball to which the instrument can be directly applied. According to Würdemann, "fully a third of the globe, including the nerve and fovea, remains impermeable to such examination"—in other words, the anterior two-thirds alone are accessible to the diaphanoscope. Marple[11] states that the instrument cannot reach back of the equator, except in a few eyes. My personal experiences with Lange's appliance have convinced me that one may often reach considerably beyond the equator. The only disadvantage of Lange's transilluminator lies in the amount of diffused light yielded by it, thereby rendering the pupillary glow so much the less conspicuous.

All ophthalmic surgeons are alive to the difficulties that may attend the diagnosis of an intra-ocular growth. It may be doubted if the entire range of ophthalmology includes a condition more surrounded by diagnostic pitfalls, or one where the surgeon's decision is fraught with more momentous consequences. This is especially the case when the lens is opaque or the media so hazy that the deeper parts of the globe cannot be examined, or when there is a detachment of the

retina, the precise nature of which cannot be determined with the ophthalmoscope. In some of these difficult cases the expedient recommended by Hirschberg[12] may be of service, namely, the direct illumination of the interior of the eyeball through the dilated pupil by means of a specially powerful electric lamp. Indeed, Hirschberg prefers this method to transillumination. In such cases, history may be imperfect, the intra-ocular tension may afford no help, and we are not infrequently driven to remove the eyeball on the suspicion merely that it contains a new growth. In fact, we fall back upon the sound rule, recognized by and acted on by every ophthalmic surgeon, *viz.*, to enucleate an eyeball that is at once devoid of sight and painful on the chance that it may contain a neoplasm. At the same time, it is remarkable what a small proportion of such eyes, after removal, are found to contain tumours. But the error (if it be an error) is one on the safe side.

It is in this class of case that diaphanoscopy may yield indications of great importance, more especially when a neoplasm, sarcomatous or otherwise, affects the anterior two-thirds of the globe. Under these circumstances, no ruddy glow, or a much modified one, will be apparent through the pupil when the instrument is placed on the part of the sclerotic which corresponds with the scleral position of the growth within the eyeball. In tumours of the ciliary region the method is invaluable, and is quite the most trustworthy means of diagnosis at our disposal. Under ordinary circumstances, as is well known, the ciliary region, the ora serrata, and 1 mm. or 1·5 mm. of the retina and choroid are, as it were, ultra-ophthalmoscopic. A neoplasm which originates from this part, therefore, is apt to pass unrecognised until it has reached notable dimensions. Trantas[13] maintains that the region in question is accessible to the ophthalmoscope provided digital pressure be made on the ciliary body and a plus 4D. or 5D. lens be placed behind the smaller mirror of the instrument. It is possible that the plan devised by Trantas may render aid in the diagnosis of tumours of the ciliary zone, which extends 8 mm. or 9 mm. around the limbus. Fridenberg[14] has suggested that the ciliary region may be explored by a combination of transillumination and ophthalmoscopy. The Sachs' instrument is applied to the sclera directly over the point to be examined, and it will then be found that with the ophthalmoscope it is possible "to get a very clear and beautifully brilliant picture of the fundus almost as far forward as the ciliary processes." Fridenberg's idea obviously is that the difficulties which attend the ophthalmoscopic examination of this region depend mainly upon the difficulty of illumination and not, as is usually believed, on an inability to bring the region into the field of vision.

In the following case I feel convinced that the routine

TRANSILLUMINATION OF THE EYE

BY

SYDNEY STEPHENSON

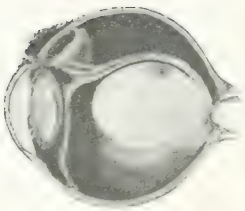

FIG. 1.

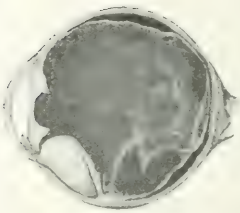

FIG. 2.

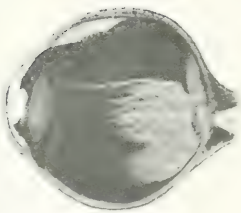

FIG. 3

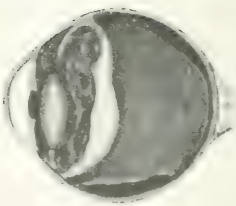

FIG. 4

To face page 995

employment of the transilluminator would have saved me from making a somewhat humiliating blunder:

CASE NO. 1.—On November 24th, 1898, I was asked by Dr. R. F. Burt, of Stroud Green, N., to see a gentleman, 73 years of age, whose left eye had been inflamed and painful for four days. According to the very imperfect history obtained, the same eye had been inflamed two years ago after an injury inflicted upon it by the prong of the patient's spectacles. The patient did not know whether the eye had or had not good sight prior to the present attack. *Present state.*—L.E. Pupil 6mm. and motionless to light. Eye deeply injected. Vision = doubtful perception of light. Tension *plus* 3. Corneal epithelium hazy, especially over the lower segment. A small pigment spot lay on the anterior capsule of the lens, in the upper and inner part of the latter. No reflex could be obtained with the mirror from the fundus. There seemed to be some likelihood that this was an instance of acute primary glaucoma, despite the fact that the patient's other eye showed no obvious changes. An intra-ocular neoplasm, of course, was not excluded. *Treatment and Progress.*—On November 25th, 1898, under chloroform, iridectomy was made upwards. The incision (keratome) was rather peripheral, and towards the close of the operation, a tiny bead of what looked like vitreous was seen through the wound. The patient was again visited on December 4th, 1898 that is, nine days after operation. There was then slight œdema of the lids of the left eye, together with a trace of muco-purulent secretion. V. = no perception of light. Marked injection of globe. Tension slightly *plus*. Anterior chamber re-formed. The iridectomy incision was occupied by a tag of vitreous humour, kept in place, it would seem, by the conjunctiva having healed over it. A little blood-clot remained about the cut edges of the iris. A definite opinion was expressed that the eye contained a tumour, and enucleation was strongly advised and forthwith accepted. *Pathology.*—The specimen was hardened in formol (10 per cent.), frozen, and bisected. A tumour of some size (*see* figure 1 on plate) was found to be growing from the choroid and to have caused total detachment of the retina. Microscopically, the neoplasm was a leuco-sarcoma made up of a mixture of round and spindle cells. It was vascular, the vessels being large, and their walls composed of sarcomatous elements. The arrangement of the cells was peculiar. Thus, they were grouped together, leaving numerous spaces, which, under the low power of the microscope, caused the growth to appear spongy. The optic nerve was not invaded. *Result.*—The patient was seen in August, 1903, suffering from the fundus manifestations of angio-sclerosis. I am informed (July 26, 1908) by Dr. Burt that Mr. D —— is still alive and active at the advanced age of 83 years.

In the following cases the result of transillumination clinched the diagnosis of a neoplasm of the ciliary body:—

CASE NO. 2.—A man, 58 years of age, was seen in January, 1908, complaining that his right eye, described as "always a bit weak," had been painful and inflamed for about six weeks. It was uncertain from the history given by this unintelligent patient whether the eye could see before it became painful. It was clear, however, that the vision had failed during the progress of the inflammatory attack. *On examination.*—R.E. V. = fingers at 25 cm. Projection good. Tension plus 2. Dusky ciliary redness, especially below the cornea, where there was a cluster of dilated blood-vessels. Pupil 4 mm. in diameter and motionless to light. In the lower sinus of the anterior chamber lay a small, hemispherical mass, of plum colour, resembling blood-clot. At its most salient part it had a height of about 1 mm. Although a faint reflex could be obtained, yet no details of the fundus oculi could be made out. When the transilluminator was applied to the sclera below the cornea, no glow could be obtained through the pupil, although at all other points in the ciliary zone such a glow could be elicited. L.E. Tension normal. V. = $\frac{5}{5}$ plus 4·5 D. Sph. = $\frac{5}{5}$. Fundus normal. Field for white had almost its full limits. No pericentral or paracentral scotomata. Evidence of glaucoma negative. *Treatment.*—The patient's right eye was removed, and when opened after hardening, was found to contain a leuco-sarcoma of the choroid, the anterior two-thirds of which involved the lower part of the ciliary body.

CASE NO. 3.—Mrs. T——, aged 35 years, was seen in consultation with Mr. Robert W. Doyne, on May 18th, 1906. Her sight had been failing for about four months, and at the time of examination was barely 6/12. Tension normal

There was some redness below the left cornea. At the lower part of the anterior chamber of the left eye was a curious-looking, heaped-up little mass of semitranslucent appearance and brown-green colour. It seemed to be made up of blocks of material, and it filled perhaps one-sixth of the anterior chamber. The optic disc was blurred, and there was some exudation about the vessels in the central region of the fundus. The transilluminator gave a satisfactory pupillary glow, except when it was applied to the sclera immediately below the cornea for a distance of about 5 mm., a position from which no glow could be elicited. On that account a diagnosis was made of a neoplasm of the lower part of the ciliary region. On fully dilating the pupil, some ophthalmoscopic indications could be obtained of a mass projecting into the anterior part of the vitreous and presumably springing from the lower part of the region of the ciliary body. The sight of the affected eye had fallen to 6/36 by September 9th. There was no secondary glaucoma. The eye was removed by Mr. Doyne on October 21st, 1906, and when opened in the vertical meridian, was found to contain a neoplasm originating from the ciliary region (*see* figure 2 on plate). It formed a small, greyish, hemispherical mass, measuring 4 mm. by 8 mm., and extending from the root of the iris, on the one hand, to the ora serrata, on the other. A narrow extension of the tumour mass could be seen, even with the naked eye, to pass through the root of the iris into the lower sinus of the anterior chamber. Microscopically, the growth proved to be a round-celled sarcoma with little pigment.

As regards the use of the transilluminator in the detection of sarcomata in deeper parts of the eye, Sir Henry R. Swanzy[15] has given a couple of striking examples. In one of his cases the neoplasm was situated in the lower-outer quadrant of the right eye, "one-third of the tumour being in front of the equator and two-thirds behind the equator." There was a circumscribed and prominent detachment of the retina, with a well-marked corresponding defect in the visual field. Vision was 6/9, and the smallest near-type could be read by the affected eye. In Swanzy's second case ophthalmoscopic examination was rendered impossible owing to the state of the cornea. The eye was blind and tension was plus 2. The transilluminator gave the "tumour reaction" when applied to the inner aspect of the globe, both in front of and behind the equator. When the eyeball was opened after enucleation, it was found that two-fifths of the inner portion of the choroid were occupied by a sarcoma.

In the case to be next narrated, the diaphanoscope led to the positive diagnosis of intraocular growth:

Case No. 4.—A gentleman of 71 years was seen by me towards the end of 1903, complaining that the sight of one eye had failed during the last ten days. Coloured lights had been noticed in the affected eye, but there had been neither pain nor discomfort. No history of injury. *Present state.*—R. V. = 2/36. T.n. L V. = 6/6. T.n. There were fine opacities in the anterior part of the vitreous of the right eye. A steep, whitish, solid-looking detachment, the summit of which could be seen with a *plus* 12 D. lens, lay in the upper hemisphere of the fundus oculi. In addition to this, the outer part of the fundus was occupied by a transparent detachment of the retina.* The visual field for a 15mm. white square was defective below and internally (20° in the latter and 15° in the former situation). The transilluminator yielded a "tumour reaction" when applied to the sclera above the cornea, but not elsewhere.

The anatomical limitations of diaphanoscopy have already been

*J. Herbert Parsons[16] has insisted on the frequency of simple detachment of the retina in association with an early sarcoma of the choroid occupying some other part of the fundus. The observation is of practical importance.

touched upon. But it may now be asked whether there are any material fallacies attached to the method in the diagnosis of intra-ocular growths. The answer to this question must unfortunately be in the affirmative. In Marple's curious case[11] "a mistake nearly arose from employing too powerful a light, such as that yielded by the Sachs' lamp." The patient, a man aged about 60 years, presented what appeared to be a neoplasm in the upper part of the sagittal meridian of the globe. The Sachs' instrument gave a negative result, inasmuch as the pupillary glow remained undiminished, no matter where the transilluminator was applied back of the ciliary region, a result obtained by Leber's appliance also. But when the rheostat was so arranged as to reduce the brightness of the Leber lamp by more than 50 per cent., the "tumour reaction" was obtained when the glowing end was passed over the region of the neoplasm. Marple concludes: "That a negative result with a very powerful light does not mean that there is no neoplasm; it signifies that the latter is non-pigmented or sparingly pigmented. It is probable also that a thin, flat, tumour might escape detection, although I know of no case in point."

Another fallacy has been pointed out by G. F. Suker [17], who found that if a tumour be accompanied by more or less abundant intra-ocular hæmorrhage "an accentuated red fundus reflex is nearly always obtained," and this "obscures the shadow caused by the tumour." The explanation I give in Suker's own words, for I am constrained to confess that his meaning is not altogether clear to my mind. It is, however, possible that he refers to a fallacy of which the next two cases are examples—namely, that vitreous hæmorrhage, accompanied or not by a choroidal sarcoma, may yield the so-called "tumour reaction."

Case No. 5.—Elizabeth H————, 55 years, was first seen on April 10th, 1905, complaining that the sight of her right eye had been defective for six months, and that pain in the eye had been present for seven days. *On examination.*—R.E. ciliary redness. Pupil about 4·5mm. and motionless to light. V. = perception of light. Tension *plus* I. A greyish reflex, on which vessels can be indistinctly recognised, can be obtained from behind the transparent crystalline lens. It represents a detached retina. Although the Leber transilluminator was carefully applied to every accessible part of the sclera, yet in no position was it possible to obtain a red glow through the pupil. L.E. V. 6/18. T.n. (full). Visual field for a 5mm. white square showed a contraction of 20 degrees on the temporal side, but the patient's low degree of intelligence probably had something to do with this result. *Diagnosis.*—Sarcoma of the choroid. Excision of the right eye was urged upon the patient, but refused by her. *Progress and Treatment.*—A few days after she was first seen, the woman came in great pain, owing to an increase in the tension of the eyeball. On April 20th, 1905, the eye was enucleated. *Pathological examination.*—Right eyeball 23mm. by 24mm., with a piece of the optic nerve, 14mm. in length, attached to it. Globe frozen, and divided in the horizontal meridian. A non-pigmented growth, resembling a champagne cork in appearance, occupies roughly the posterior half of the bisected globe, especially on the temporal side (*see* fig 3 on plate). It originates from the choroid, and has detached the retina completely, so that in front the last-named lies in contact with the posterior surface of the crystalline lens. The few, small, cleft-like, darker markings on the cut surface of the neoplasm probably represent hæmorrhages. The part of the vitreous chamber not occupied by the growth is filled completely by a dark-coloured mass of blood-clot. The crystalline lens lies in close contact with the cornea. Microscopically, a choroidal sarcoma,

composed of round or oval cells, and containing very little pigment. Its blood-spaces are large and numerous, and the tumour is arranged in a reticular sort of way. In some sections pieces of the retina, much altered, can be recognised covering the tumour. It may be added as a point of some little interest that corpora amylacea were found in sections of the optic nerve (arachnoid) behind the eyeball.

Case No. 6.—Mary S———, 43 years, first seen on July 18th, 1906. Patient complained of blindness of the left eye of twelve months' duration. The failure of sight, which began in the upper part of the field, had been painless. *Present state.*—R.E. V. 5/5. T.n. L.E. V. no p.l, T. *plus* 2. Posterior synechiæ and a fine membrane in pupil. No details of fundus can be made out, although a faint reflex can be obtained except below and to the outer side. Transillumination negative. *Provisional diagnosis.*—Intra-ocular growth, accompanied by irido-cyclitis. *Further history.*—On September 18th, 1907, *i.e.*, fourteen months after patient was first seen, the affected eye was blind but not painful, with tension 1½. It was divergent, and possibly a little more prominent than its fellow. Fundus not illuminable. Floating blood-clot could be recognised in the forepart of the vitreous chamber. When the Leber or the Lange transilluminator was applied to the sclera below the cornea, no glow could be obtained through the pupil. Removal of the eye was accordingly urged (not for the first time) upon the patient, but the operation was not performed until November 6th, 1907. *Pathological examination.*—Measurements of the enucleated eyeball were 27·5mm. by 24mm. After suitable preparation, it was frozen and bisected in the horizontal meridan. The lower hemisphere, when mounted in 10 per cent. formol, according to Priestley Smith's method, showed the following points:—The posterior two-thirds of the retina were *in situ*, but the anterior third (as shown by figure 4 on plate) was steeply detached from the underlying parts by reticulated blood-clot. The detachment floated when the specimen jar was moved about. Lens, anterior chamber, iris, and cornea were normal to the naked eye.

The diaphanoscope has other uses besides that of rendering help in the diagnosis of certain cases of intra-ocular growth. Rochon-Duvigneaud [7], who, curiously enough, scarcely mentions this point, alludes to the identification in the normal eye of pigmentary defects in the iris, of the festooned line of the ora serrata, and of the black striæ that mark the origin of the ciliary processes. Among the things that may be revealed by the instrument in diseased eyes, the same author enumerates foreign bodies in the crystalline lens, opacities in the vitreous humour, and the pigmentary changes that are apt to follow inflammation of the iris. Stoewer [19] recommends trans-illumination of the sclera as a means of determining the hemianopic reaction of the pupil. Edgar S. Thomson [20], who prefers Sachs' lamp to the other instruments, claims that important details in the ciliary region and anterior part of the choroid that would be otherwise inaccessible, can be studied with the diaphanoscope. Würdemann [21] has obtained useful information from diaphanoscopy in cases of glaucoma. He also describes its use in such conditions as occlusion of the pupil, synechiæ, various forms of cataract, rents of the iris, foreign bodies in the lens or vitreous, and so forth. A coloured plate is given by Würdemann, showing the appearances in these and some other conditions. H. Vuellers [18] has laid stress upon the help given by the Sachs' lamp in the recognition of localised atrophy of the uveal layers of pigment in cases of irido-cyclitis, holes in the iris made by foreign bodies, etc. Jenssen [22] found that the smallest foreign body in the cornea could be illuminated by Sachs' lamp applied to the sclera, as could also opacities of

or foreign bodies in the lens, flocculi in the vitreous humour, changes in the iris, and so forth.

In the last case to be quoted, transillumination allowed equatorial staphylomata, due to glaucoma, to be definitely diagnosed. The facts follow :—

Case No. 7.—Rachel N ——, 46 years, first seen on October 17, 1904. The appearances characteristic of glaucomatous degeneration were present—that is to say, no perception of light, high tension, dilated and motionless pupils, shallow anterior chamber, and porcelainous sclera. There was also a detached retina in the right eye. June 19, 1905.—A firm, tender, dusky nodule lying beneath the ocular conjunctiva in the lower-outer quadrant of the right eyeball, corresponding roughly with the detachment noted above, was found on this date. April 25, 1906.—R.E. a globular swelling can be felt through the lower lid. When exposed by drawing the lid downward, a dusky lump, the size of a pea, is found to lie in the interval between the inferior and external recti muscles. It is free from tenderness. The conjunctiva can be moved over it. Moreover, a small oblong area of dark colour is present in the upper-inner quadrant of the eyeball, and can be seen when the globe is abducted. L.E. a mass smaller than, but otherwise resembling, that described in the right eye lies at the lower end of the vertical meridian of the eyeball, while at the upper end of the same meridian is a second protrusion, having the size of a tiny pea. No particular pain. Tension *plus* 2 or more No perception of light. Left pupil dilated *ad max.* and motionless. Right pupil smaller than the left, and oval in consequence of posterior synechiæ. In this case diaphanoscopy was employed to decide whether or not the scleral protusions represented solid growths, which seemed unlikely, or equatorial staphylomata, such as are known to occur in cases of glaucomatous degeneration. The point of the instrument placed turn by turn on each of the scleral protusions allowed light to pass freely through the pupil. The diagnosis of equatorial staphylomata was accordingly made.

In conclusion, I re-echo the words of Würdemann,[10] who believes " that transillumination of the eye is a necessary adjunct to the dark-room examination." I am convinced that it yields results difficult or impossible to obtain by any other method at present at our disposal.

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TRANSLATION.

ON OPERATIONS FOR AFTER-CATARACT.*

BY

G. WEIL,

STRASSBURG, ALSACE-LORRAINE.

Operations for after-cataract are still, in spite of the introduction of antiseptic methods, regarded by many operators as by no means trivial procedures, whereas others think them harmless, and perform them as a routine operation shortly after every extraction. This difference of opinion depends largely upon the method chosen by different surgeons. An operation, for example, that demands general anæsthesia, a large incision, and complete loss of the aqueous, and is often accompanied by prolapse, or even loss, of vitreous, is naturally more to be feared than one which avoids all these conditions.

The common complications of an operation for after-cataract are :

1. *Infection of the eye.* This is now, thanks to aseptic methods, very infrequent, but is still occasionally observed after all operations. It is nevertheless not a matter of complete indifference whether the operation takes a long or a short time, whether one or many instruments be introduced into the eye, whether the vitreous or the iris be wounded, and, lastly, whether vitreous escape or not.

2. *Loss of vitreous.*—The larger the corneal section the greater the danger that, in consequence of straining by a nervous patient after the capsule has been removed, vitreous may enter the anterior chamber and even prolapse. In many of the operations practised this is a frequent occurrence, although generally only a little escapes,

3. *Secondary glaucoma.*—This is now universally admitted to be caused by the sudden entry of vitreous into the anterior chamber, and gives rise, according to Terrien in 2 per cent., to Knapp in 3 per cent. of all needling operations, to a condition which is always unpleasant and sometimes incurable. The more aqueous escapes the more room there is for vitreous in the anterior chamber, especially when, as the result of a large incision or because capsule has been caught in the wound, the aqueous must be frequently renewed or discharged.

4.—*Entanglement of the capsule in the wound* with all its sequelæ (infection, prolonged cicatrisation, slow re-formation of the anterior chamber, and secondary glaucoma).

*Translated from *Zeitschrift für Augenheilkunde*, February, 1908, by T. Harrison Butler, M.D. (Oxon.), Coventry, England.

5. *Tearing and hæmorrhage of the ciliary body or iris.*—This is the invariable result of unilateral pulling upon the capsule, which is often tightly bound to the iris.

6. *The danger of general anæsthesia.*—This must not be dismissed as chimerical, more especially as cataract patients are frequently old and sometimes suffer from albuminuria and glycosuria. The extraction itself may have been possible without anæsthesia, but many methods of treating capsular cataract are so liable to be accompanied by loss of vitreous that general narcosis is essential.

The most useful operation is one which avoids these complications or, at any rate, reduces them to a minimum.

I do not hesitate to recommend Stilling's operation with two harpoon-needles as one fulfilling these demands.

Its advantages depend upon the several facts that:—

(a) The operation is scarcely ever accompanied by loss of the aqueous humour.

(b) In consequence, the danger of entry of vitreous into the anterior chamber and of wounding the iris is practically excluded.

(c) General anæsthesia, except for quite small children, is unnecessary.

(d) The after treatment is very simple, and generally lasts for two or three days only.

This last fact is important, for it often happens that patients refuse a second operation if it involves a long period in bed.

I have performed the operation 130 times in recent years, and have seen Stilling perform it about 30 times, so I have some grounds upon which to form an opinion. Among these cases there was not one of septic infection or loss of vitreous, only once secondary glaucoma, and once slight hæmorrhage from the iris. The glaucoma yielded to eserine, and the patient has for years seen well and been able to read with this eye. The hæmorrhage was in a case where the pupil was almost closed, the result of repeated hæmorrhage after the extraction. During the needling the patient squeezed so much that all the aqueous escaped, and while withdrawing the needle, I tore the iris. The final result was good. I have seen no serious harm follow either my own or Stilling's operations. I have therefore for a long time regarded the procedure as harmless and satisfactory.

Having stated the advantages of the method, I shall not deny that there is a disadvantage, and that is the reason that so many of my colleagues cannot approve of the operation. It lies in the difficulty of withdrawing the needles, which can be a very real one, and often makes the operator rather anxious. But this difficulty can be easily overcome, or the evil consequences avoided, by practice, and by ascertaining carefully that the instrument maker has manufactured the needles exactly to my pattern.

I shall assume that the form of the needles is now well known. They were devised by Stilling 30 years ago, but neither described nor used. In 1893, seeing Stilling perform Noyes' capsule operation, I suggested that a special instrument might be devised which would permit Noyes' otherwise excellent double operation to be performed at one sitting. Stilling told me that he had invented a harpoon-needle for this very purpose years before but so far he had not used it. We had many patterns made, but they often got hooked into the pig's eyes and leather-drums used to test them until I succeeded in obviating this catching by a certain manœuvre which I shall shortly describe. During the last year I have made the needle somewhat longer and the barb a little finer, but Stilling's original pattern has not been essentially altered.

To make myself understood, I shall now describe the course of of the operation which we have in course of years found the safest and simplest.

I may remark that I perform needling only in a dark room by artificial light. I generally use a simple acetylene bicycle lamp. I have replaced the bull's-eye by a lens of 6 dioptres, and get my assistant to concentrate the light upon the field of operation with a simple lens. I have given up the electric forehead light, which is so dazzling to the patient.

The eye is best fixed by two forceps, one applied at the inferior and the other at the superior end of the vertical meridian of the eye. The needles are now inserted simultaneously into the eye on the flat with the barbs facing each other, entering the cornea at a spot on each side 2-3 mm. from the corneal margin. They pass parallel to the surface of the iris till they reach the centre of the pupillary region. They are now rotated through 90°, so that the barbs can dip into the capsule. There is a mark on the handle to indicate the position of the barb. The capsule is now torn by a slow withdrawal of the needles *without raising the handles* and without permitting the points of the instruments to enter the vitreous. The aperture in the capsule can easily be detected by artificial light, and is often made more obvious by the vitreous coming forward. If the opening be not sufficiently large, the needles can be pushed in again, and the manœuvre repeated as often as may be necessary, but without exerting any pressure. To withdraw the needles they must be twisted into the *original position in which they were inserted* by turning the handles; then with a slight pull they are drawn out, *both needles being as far as possible simultaneously pressed against that side of the wound which corresponds to the back of the barb.* This last act of the operation is certainly the most difficult, for the hook often catches. The needle must under these circumstances never be forcibly torn out; it must be pushed in again and *the back of the harpoon pressed a little harder against the*

lip of the wound. It is not always possible to remove both the needles at the same moment, but this is not a matter of importance. The first is withdrawn, the eye fixed with forceps, and then the second, as a rule, follows easily. No accident has ever happened to Stilling or myself, but we know that in the hands of even dexterous operators the barb has broken off in the anterior chamber, and magnet-extraction has become necessary. This annoying complication can always be avoided if the needles be only used twice and then returned to the maker to be tested, and especially *if the back* of the barb be always pressed against the wound-lip during extraction.*

A good idea of the difficulty likely to be met with and the knack of overcoming it can be best obtained by experimenting with the leather-drum which we use for testing the sharpness of our keratomes and knives. It is essential that everyone proposing to adopt the method *in vivo* practise upon the drum. A little practice will soon convince the surgeon that entanglement of the needles can be avoided only by careful attention to the rules given.

From the somewhat minute description of the necessary manipulations it might be imagined that very difficult manœuvres were demanded. Such is not the case. The method is easy to learn and to carry out after some practice on the test-drum.

T. HARRISON BUTLER.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—SPOROTRICHOSIS OF THE EYELID.

Morax and Carlotti.—On palpebral sporotrichosis. (La sporotrichose palpébrale.) *Annales d'Oculistique*, T. CXXXIX, p. 418, juin, 1908.

Morax and Carlotti give an account of what is known clinically and pathologically of sporotrichosis, and record a case in which the disease occurred in the eyelid. The following is a *résumé* of their article.

The name of sporotrichum has been given by Link to a group of mucedines characterised by fine slightly coloured mycelium, with or without septa, with valved conidiphores and simple ovoid conidia. Since Schenk, in 1898, demonstrated

*By the back is meant the side of the needle which does not carry the hook.

the pathogenicity of sporotrichae, the following clinical varieties of sporotrichosis have been described.—(1) A gummatous lymphangitic form commencing three months after a traumatism as a cutaneous ulceration, followed rapidly by the appearance of hard, round nodules spreading centrally along the course of the lymphatic vessels, while the corresponding glands become swollen, soften, and discharge their contents. (2) A multiple subcutaneous gummatous form, characterised by the appearance all over the body within the course of three or four weeks of subcutaneous nodules, which are at first mobile, hard, elastic, and painless, but in about four weeks double in size and become adherent to the skin and fluctuating; when opened, these are found to contain a viscid liquid, which later becomes purulent. When emptied, the nodules have scarcely any wall, and rapidly regress, leaving a characteristic scar with three zones: a central, white with cicatricial bands; a medium, deep-brown; and an external, which gradually fades away into the surrounding skin. (3) A form with multiple subcutaneous abscesses. (4) A dermic form infiltrating the skin without ulceration or glandular involvement. (5) An epidermic form which has not been seen alone, and occurs as *plaques*, the size of the palm of the hand, with pink desquamating centres. (6) A form localised in the mucous membrane, the prognosis of which is grave, as one of the two recorded cases proved fatal. For the diagnosis of the disease, laboratory methods are necessary. Examination of smears, as a rule, shows nothing characteristic.

Cultures should be made on peptonised glucose agar and glycerinated agar, and kept, some at 37° C. and others at the temperature of the room, for 14 days before a final opinion is formed. On these one of the following varieties may be found: (a) sporotrichum Schenkii. This commences to show in from 24-48 hours as greyish colonies, and which later become porcelain-white, and spread into the nutrient medium. The thick colonies take a chocolate colour on the 5th or 6th day, and subsequently become black, resembling mountain chains as marked on maps. (b) Sporotrichum Beurmanni. This grows more freely at room temperature than in an incubator. It commences to be visible on the 4th or 5th day as small bluish-white, translucid specks, which on the 9th day resemble the cerebral convolutions. On the 20th day the colony begins to get brown in the centre, while the periphery becomes powdered with a white dust. (c) Sporotrichum Dori. This grows in small whitish colonies, which appear suddenly and never become large. They do not get brown and they disappear after several re-cultures. Under a 1/12 inch immersion lens smear preparations from the cultures, stained with basic aniline dyes, show, in addition to elongated elements, more or less resembling filamentary microbes but with very varying diameters, a large number of round or oval elements

(clamydospores) some isolated and some attached to the course or extremity of a filament or even forming masses or sheaths on each side of it. These various bodies stain deeply with Ziehl's fuchsin, gentian-violet, or even hæmatoxylin, and retain their violet colour at least partly when treated with Gram's solution, but are decoloured by acids. On careful examination, filaments, stained with Unna's blue, are found to contain violet-coloured granules, some fine and others large, the latter of which are regarded as nuclei. Examined in hanging-drop preparation, the mycelian filaments are seen to be long, more or less rectangular, ramified, and even anastomotic. Most of the ramifications are spore-bearing. When unstained, the filaments are colourless and the spores brown, the latter being attached by short pedicles to filaments which spring at right angles from the main stems.

Sporotricha grow on all vegetable media, especially potatoes, carrots, cabbage, and artichokes. In practice all other media may be avoided in favour of agar-glucose, glycerinated agar, glucose-bouillon, and glucose or glycerinated potato or carrot. The appearance on glycerinated agar is the same as on glucose-agar, but the growth is slower. Glucose-bouillon (3 to 4 per cent.) is useful for inoculation. It becomes covered with a smooth white film, 1 mm. thick, which eventually sinks to the bottom of the tube and is replaced by a new film. Glycerinated potato (4 per cent.) shows on the 5th day small white spots which become confluent on the 8th day. At the end of three weeks the surface is covered with knobs and has a brown colour. On glycerinated carrot (4 per cent.) the appearance is the same, but the development is twice as quick.

On microscopic examination, the epidermis and dermis covering a node have been found to show only slight reaction, characterised by thickening of the horny layer and irritation of the sub-papillary layer, with cellular infiltration around the vessels. The node itself contains three zones :—1. the central zone consisting of an acidophile soft granular mass stippled with fine debris from disintegrated polynuclears. The periphery of this zone contains more numerous polynuclears, a colloid framework, and some vessels with desquamating endothelium. 2. a zone of connective tissue cellular reaction with tuberculous nodules and giant cells, numerous polynuclears, a few lymphocytes, and exceptional eosinophiles. 3. a fibro-connective tissue zone, free from giant cells and nodules, in which the follicles become less numerous, then mononuclears appear, followed suddenly by colloid fibres surrounded by swollen connective tissue cells.

The demonstration of the parasite in pus is untrustworthy and in sections it is still more difficult. Inoculation with pus gives negative results, but with cultures, lesions both local and at a distance can be produced. Guinea pigs are fairly susceptible ; mice die rapidly even with small doses ; cats and rats have given

the best results. Locally, an induration forms, which in three weeks develops into a node, which breaks down and discharges yellowish pus. Histologically, the node consists of a central abscess, containing pus and numerous parasites, surrounded by a wall formed of hypertrophied connective tissue cells pressed against each other and stuffed with spirotriches. There are no giant cells. Where generalisation takes place, metastases are formed in the liver, spleen, and lungs.

Greco has recorded the case of a sailor with a persistent ulcer of the eyelid following a hordeolum, who a year and a half subsequently developed sporotrichosis of the foot. But apart from this the only case of palpebral sporotrichosis reported previous to the publication of the article under review was that of Danlos and Blanc, whose patient, a man, aged 63, with a swelling probably of a tuberculous nature on the back of his right wrist, but otherwise healthy, developed on his lower eyelid a small white spot, which rapidly grew to the size of a bean and suppurated. This was treated with tincture of iodine, and subsequently excised, with the result that a sinus formed, discharging through several fistulæ. Cultures of discharge were made, and in ten days typical colonies of sporotrichum Beurmanni had developed, along with a few colonies of staphylococcus aureus.

The author's patient, aged 70 years, had a bluish discolouration of the entire left upper eyelid extending to within 6 or 7 mm. of the eyebrows, with an arched row of small skin abscesses running just inside its margin, and three elongated dermo-epidermic ulcers on the ciliary edge of the upper lid, which was covered with crusts. A very marked characteristic of the clinical picture was a large swollen lymphatic, the size of a pipe stem, resembling those occurring in glanders, running in the shape of an inverted S from the external canthus towards the inferior maxillary angle and back to the angulo-maxillary, submaxillary, and preauricular glands, which were swollen to varying degrees. There was no other glandular swelling, and the conjunctiva and eye were absolutely normal. The lesions were not painful, but the blepharitis caused some discomfort. Pressure on the affected upper lid, which was a little thickened, caused slight pain. The patient gave a history that his eye had first become uncomfortable four or five weeks previously, and that one week later the crusts had appeared on the lid margin and the lymphatic enlargement had developed. Ordinary treatment had been tried without benefit. As the appearances pointed to tuberculosis, glanders or sporotrichosis, specimens were taken for bacteriological examination. In smear preparations no micro-organisms were found. Cultures on peptonised bouillon, ascitic-fluid agar, glucose-agar, and glycerinated carrot produced typical colonies of sporotrichum Schenki. Smears between the 8th and 12th days showed numerous

filaments bifurcating and interlacing without recognisable anastomoses, and having conidia isolated and in groups in the intervals between the filaments or attached to their branches. Stained for three minutes with Unna's blue and differentiated in 95 per cent. alcohol, the whole filament was coloured pale-blue and contained violet granules of varying sizes and traces of unstained septa, while the conidia took a deep blue colour. As the time went on, the filaments became fewer in number and the conidia more numerous, until, at the end of three weeks, smears contained only a few isolated trunks lost in a mass of ovoid granules. Two mice, which were inoculated with cultures, developed between the 10th and 15th days ulceration of the skin with yellow crusts. Smears made from the discharge of these shewed among polynuclears some very slender ovoid corpuscles 2 μ to 3 μ long, exactly similar to the shuttle forms described by Monier-Vinard and Lesné. A rabbit, which received an injection of 1/5 c.c. of culture behind its ear, developed two small nodules at the site of the injection, one of which broke down and formed an ulcer. Pus from an unopened nodule was injected under the skin of the abdomen of two guinea pigs and produced no result, thus excluding tuberculosis. The patient was put on 30 grains of potassium iodide daily, with the result that in four days no further sporotricha could be obtained from the secretions, and his condition was much improved, while at the end of 66 days all traces of the disease had disappeared. The author's case, which was characterised by lymphatic invasion and depended on a pathogenic agent which developed rapidly, is in contrast to that of Danlos and Blanc, which depended on a slowly growing organism and showed no appreciable lymphatic reaction. It is of importance to diagnose sporotrichosis correctly, especially from syphilis and tuberculosis. Clinically, the inactive appearance of the lesions, which are surrounded by healthy tissue, the small amount of thickening and induration, and the absence of bluish undermined edges and whitish sloughs should arouse suspicion. The course of the disease will distinguish it from suppurating chalazion; leprous ulcerations are always accompanied by other cutaneous or visceral lesions; and neoplasms are liable to bleed and have thickened edges and bases. Certainty of diagnosis, however, can be obtained only by culture experiments. Treatment with potassium iodide has proved effective in all cases which were not of too old standing, but if left to itself, the disease sooner or later forms metastases, of which those in the mucous membrane seem to be particularly dangerous. R. J. COULTER.

II.—THE DIAGNOSIS OF CENTRAL COLOUR SCOTOMATA.

Holth, S. — On the diagnosis of central colour scotoma by means of three identical objects. Du diagnostic du scotome central pour les couleurs à l'aide de trois objets identiques simultanés. *Annales d'Oculistique*, septembre, 1908.

Some years ago **Holth** (Christiania) saw Bjerrum search for central scotomata by getting the patient to fix the top button of his waistcoat, on either side of which was placed in succession a

FIG. 1

red counter, about 3cm. in diameter. In cases of toxic amblyopia the colour of the counter on the temporal side became modified. After seeing this device, Holth employed as the test-object the red end with which certain matches of Norwegian manufacture are provided, first damped in order to render the colour uniform. In some cases of strictly central scotoma, however, this plan failed, and Holth then used three objects of the same colour, as shown in figure 1. A later development of

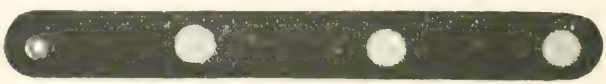


FIG. 2a

the same idea was to construct a so-called "Chromoscotometer" (see figure 2a), constructed of an ebonite *plaque*, 16 cm. by 2 cm. by 4 mm., pierced by holes of various sizes, filled with rose-coloured wax to the level of the surface of the instrument. The

scale was held horizontally at a distance of 30 cm. in front of the patient, seated with his back to the window. The patient fixed the central object. In alcoholic or tobacco amblyopia, the object lying on the temporal side of the fixation point was always more or less modified as regards its colour. Holth claims that

FIG. 2b

the test is extremely sensitive and that it gives positive results even in patients whose visual acuity lies between 5/10 and 5/6. When a scotoma is absolutely central, the central object becomes pale, while the others retain their colour (see figure 4a). Moreover, in paracentral scotomata, when the instrument is held

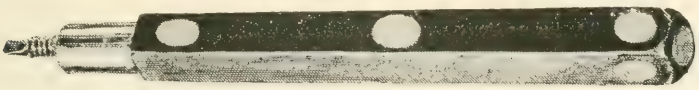


FIG. 3

vertically, the central objects becomes pale (figure 5). In cases of toxic amblyopia in Daltonism, the test is carried out with the reverse side of the appliance (figure 2b) in which a series of 5 mm. holes are filled with greyish-blue wax. The normal

FIG. 4

patient at once recognizes the grey-blue colour; but the Daltonian sees only the blue colour, while if he be affected with a central scotoma, he calls one or two of the objects "grey" or "sombre," and the nasal object alone "blue". Holth employs the handle of his ophthalmoscope (figure 3) as a chromoscotometer. Observations are recorded as three points arranged in a

FIG. 5

horizontal line, of which the ones which correspond to the scotoma are crosshatched (figure 4). For perimetry, Holth

employs the ebonite square shown in figure 6, the four sides of which contain holes of 5, 10, and 15 mm. respectively, filled

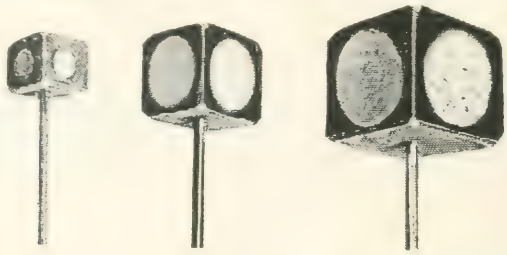


Fig. 6

with white, rose, blue, and green wax.* He has found a central scotoma to be present in cases of sympathetic irido-cyclitis, but the sign apparently is not constant. Sydney Stephenson.

III.—DISPERSION OF LIGHT IN THE CRYSTALLINE LENS.

Isakowitz, J.—Dispersion of light in the hazy media of the human lens Catar. Cœrulea). (Lichtzerstreung in trüben Medien der menschlichen Linse.) *Zeitschrift für Augenheilkunde*, Mai, 1908.

Isakowitz (Halle) discusses the cause of the colours which are conspicuous in certain hazy lenses, the so called *cataracta cœrulea*, and decides that they are due to dispersion of light. These cataracts are sometimes stellate, and have been described under the heading of *cataracta punctata congenita*. In the anterior part of the lens a group of regularly arranged, sharply differentiated, opacities can be made out, which reflect coloured rays of various degrees of saturation. The tint varies from forget-me-not blue to sea-green. The visual acuity is often good, and the lens appears to be almost clear by reflected light. The unaffected parts of the lens are of the normal yellow hue. The optical phenomena are similar to those in an opalescent medium, a homogeneous mass which contains innumerable fine particles of a different refractive index. Such a condition has been demonstrated in both human and other lenses by Becker, who found lental vacuoles lying between the lamellæ filled with a vitreous or finely granulated substance. These vacuoles would cause the appearance found in congenital punctate cataracts.

Lord Rayleigh has shown that in such a medium the intensity of the dispersed light is inversely proportional to the fourth

* The various appliances mentioned in the foregoing abstract may be obtained from Martin Vieg, 34, Kirkegaden, Christiania.

power of its wave length. It is therefore obvious that blue and green will be found in greater proportion than colours of longer length. This fact accounts for the blue and green tints which characterise these punctate cataracts. T. HARRISON BUTLER.

IV.—PRIMARY TUBERCULOSIS OF THE OPTIC DISC.

Schoeler, Fritz.—On primary tuberculosis of the optic disc. (Zur primären Tuberkulose der Sehnervenpapille.) *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1907.

Schoeler records two cases of seeming primary tuberculosis of the optic disc, in which the diagnosis was arrived at partly *per exclusionem*, partly on the strength of the family history of tubercle, and partly on a positive tuberculin reaction. The first case was a lady of middle age in good health, apart from changes in the right optic disc. It showed hyperæmia, blurred edges, and a swelling of its upper-inner parts. Central vision was good, but the visual field was irregularly contracted. No great changes occurred during the following three years, but subsequently atrophy of the optic nerve became more and more marked, until after the further lapse of three years, the disc appeared perfectly pale, vision was hardly one-third, and the field was extremely narrow. The second case was that of a man, aged 22, who also exhibited unilateral optic neuritis. The lower half of the right disc was dull, grayish, and showed a small hæmorrhage. While the visual acuity was nearly normal, there was a big defect in the upper periphery of the field. After curative injections of old tuberculin had been given for two and a half months, the central vision became normal, the field remained unchanged, but the disc gradually turned pale. C. MARKUS.

V.—THE OCULAR COMPLICATIONS OF PREGNANCY.

(1) **Knapp, Arnold.—Affections of the optic nerve during pregnancy.** *Trans. American Ophthalmological Society*, 1907.

(2) **Posey, William Campbell.—The importance of an ocular examination in pregnant women manifesting constitutional signs of toxæmia.** *Journ. American Medical Association*, March 14th, 1908.

(3) **Woods, Hiram.—Ocular complications in pregnancy.** *Journ. American Medical Association*, July 18th, 1908.

(4) **Weigelin, S.—Disease of the optic nerve in pregnancy.** *Arch. f. Augenheilkunde*, August, 1908.

(1) **Arnold Knapp** (New York) reports three cases of neuritic atrophy occurring in pregnant women with other manifestations of toxæmia.

(3) **Woods** (Baltimore) tells us that apart from the nervous symptoms incident to pregnancy, which often affect the eye functions, there are four serious ocular manifestations which are found more or less frequently during pregnancy or after parturition. The two, more common, are so-called "uræmic blindness," which is usually seen in connection with eclampsia, and so-termed "albuminuric retinitis of pregnancy." The two rare complications are a loss of central or peripheral vision, due, so far as symptoms point, to a retrobulbar neuritis, and a form of neuroretinitis, which, while not essentially suggestive of the albuminuric type, shows numerous retinal exudates and hæmorrhages. In view of pathologic investigations, the author believes that there is doubt as to whether the term "uræmic" should be applied to a blindness which occurs in same connection with puerperal eclampsia: the case, he thinks, is true regarding the renal origin of what is known as "albuminuric retinitis of pregnancy." He asserts that there is good reason to consider that both the renal and the ocular complications in such cases are manifestations of the same process—a toxæmia. The third and the fourth varieties of ocular complications of pregnancy are also the results of a pregnancy toxæmia, a toxic neuritis or a toxic thrombosis probably being the active causative factor. CHARLES A. OLIVER.

4 **Weigelin** records six cases of optic neuritis in pregnancy. Instances of this kind have been observed by several authors; some cases made a partial or complete recovery after artificial abortion or after natural labour; others recurred after subsequent pregnancies, leading to progressive deterioration of vision. Retrobulbar neuritis has been observed in one or two instances. The optic neuritis typical of pregnancy generally occurs in one of the later pregnancies, and begins some time between the fourth and ninth month. Central vision diminishes, and the fields of vision show limitation.

The first of Weigelin's cases occured in a woman, *æt.* 37, during the fifth month of her tenth pregnancy. She became blind in the course of a fortnight in both eyes, but recovered her sight in one eye after premature labour had been induced. Four months after her pregnancy, vision in the good eye was $\frac{1}{3}$ and J. 2. Repeated examination during and after her pregnancy revealed no disease of the internal organs. A remarkable thing about the case was that sight returned in the one eye after three weeks of blindness. In the second case, a woman, *æt.* 37, optic

neuritis occurred in the fifth month of the tenth pregnancy. At the ninth month R.V.=fingers at $4\frac{1}{2}$m., L.V.=hand movements. After natural labour, vision improved to R.V.=$\frac{5}{18}$, L.V.=$\frac{5}{8}$. Concentric limitation of both fields. Optic neuritis recurred in the first month of the following pregnancy. Vision failed rapidly. Artificial abortion. Two years afterwards R.V.=$\frac{5}{60}$, L.V.=$\frac{5}{8}$. Fields for colours limited, and in the right eye also for white. In the third case, a woman, *æt.* 35, optic neuritis occurred during the seventh month of the fourth pregnancy, and recurred during the fifth and sixth pregnancies. The neuritis was slight in each case, and did not reduce vision much The fourth patient, a woman, *æt.* 30, first experienced a diminution of vision during her third pregnancy. During the fourth pregnancy the vision in one eye failed altogether, and in the other, almost so. The latter recovered a little after the termination of the pregnancy. The sight that remained, however, was lost in the fifth pregnancy; optic atrophy in both eyes. In the fifth case, optic neuritis occurred in a woman, *æt.* 25; during her second pregnancy, in one eye only. She recovered her sight completely after natural labour. The sixth case was one of unilateral retrobulbar neuritis which occurred during the seventh month of the first pregnancy of a woman, *æt.* 25. V. in the affected eye at this time was $\frac{5}{18}$, and Jäger 3, and six weeks after birth of the child, V. = $\frac{5}{5}$ and J. 1. All the patients were otherwise healthy. Weigelin thinks that there can be no doubt that the pregnant condition was the cause of the optic neuritis in these cases. Artificial labour or abortion may save the sight, or some of it. Under certain circumstances, ligature of the Fallopian tubes may be indicated, to prevent future pregnancies and the recurrence of optic neuritis. PERCIVAL J. HAY.

VI.—EMBOLISM AND THROMBOSIS.

(1) **Coats, George.—Further cases of thrombosis of the central vein.** *Royal London Ophthalmic Hospital Reports*, Vol. 16, Part 4.

(2) **Pincus, Friedrich.—Complete restitution of function after apoplexia sanguinea retinæ (thrombosis venæ centralis).** [**Völlige Wiederherstellung der Funktion nach Apoplexia sanguinea retinæ (thrombosis venæ centralis)**]. *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1907.

(3) Trüchte, W.—On the question of embolism of the arteria centralis retinæ. (Zur Frage der Embolia arteriæ centralis retinæ.) *Klin. Monatsbl. f. Augenheilkunde*, März, 1908.

(4) Hesse, R.—On embolism of the central artery. (Ueber Embolie der Zentralarterie.) *Zeitschrift f. Augenheilkunde*, Mai, 1908.

(1) In a former paper published in Part I of this same volume of *Reports*, **Coats** (London) showed that no fewer than six different lesions had been described by different authors as the essential basis of this class of case. He reported four cases then, and since that time he has collected 12 others, 11 of which form the basis of this paper, and in which he endeavours to trace the real cause.

A careful clinical and pathological report is given of these cases. In every one of them an obstruction was found in the vein, which fully accounted for the symptoms, and there can be hardly a doubt but that in a typical case, obstruction would be found in some part of the central vein. This clears away two of the six explanations, *viz.*: (1) multiple emboli or thrombi of the retinal arteries, and (2) changes in the retinal vessels not the result of thrombosis or embolism. Another explanation, hæmorrhage into the substance of the optic nerve, has never been proved. Multiple thrombi of the retinal without thrombosis of the central vein may be possible, but has never been shown in a case in which the nerve has been thoroughly examined. Of all the explanations, only two seem to have stood the test. In the vast majority of cases the lesion is really a thrombus, in a more or less advanced condition of organisation. From the consideration of the after-history of these cases, the most important fact is the total immunity of the other eye. Glaucoma is seen in so large a number of affected eyes that there must be some connection between the two; but its explanation is not easy. One thing should be remembered, namely, that after the condition is once diagnosed, a mydriatic should never be used. The prognosis seems to depend much more on the general health than on anything else, and cases have been watched for years without the least deterioration of the health. In only two of the cases did thrombosis occur elsewhere, *viz.*, in the brain. C. DEVEREUX MARSHALL.

(2) The typical signs of thrombosis of the central vein were seen by **Pincus** in the right eye of an otherwise healthy man aged 46. Vision was reduced to counting fingers at 2 inches. Eight months later, nearly all the ophthalmoscopic changes had disappeared, while the vision had improved to 5/25. After the further lapse of a year, central and peripheral vision were normal as well as the fundus, except for a slight dilatation of the veins and a few streaky hæmorrhages, and white dots in the

lower temporal region of the retina. While rejecting the idea of hæmorrhage in the optic nerve sheath, Pincus countenances the possibility of either an originally incomplete blocking of the central vein, or of a subsequent repair of retinal circulation by canalisation of the thrombus or the arising of anastomoses.

C. MARKUS.

(3) **Trüchte's** case appears to have been one of real not so-called embolism of the central artery. A sudden obstruction of the artery occurred in the right eye of a man, aged 55, who died three weeks later of sepsis. The diagnosis of malignant endocarditis, with miliary infarcts in the skin and internal organs, was confirmed by autopsy. In the retinal artery, just behind the lamina cribrosa, was found a plug of hyaline structure, which adhered to the vessel wall at one point but did not completely fill the lumen. There was no disease of the wall of either artery or vein, and considering the other embolic processes in this case, the view of the obstructing body being an embolus and not a thrombus appears to be well founded. C. MARKUS.

(4) There have always been ophthalmologists who consider that the cases generally regarded as embolism of the central artery are often not of embolic origin, but due to disease of the artery leading to narrowing of its lumen. The case published by **Hesse** (Graz) is interesting because the actual embolus was not only seen with the ophthalmoscope but actually photographed by Dimmer's apparatus. A plate of five beautiful photographs of the fundus is appended to the paper, but, unfortunately, owing to deficient explanation in the text, they are rather hard to interpret. The case was treated by massage, controlled by the ophthalmoscope, and the embolus was seen to alter its position until it came to lie in the main bifurcation of the superior retinal artery. In one of the photographs it can actually be seen in this position. It was ultimately absorbed, and the patient made a fairly good recovery. T. HARRISON BUTLER.

VII.—TUMOURS.

(1) **Blok, D. J.—Angiosarcoma of upper eyelid. (Angiosarcoom van bovenvuglid.)** *Tijdschrift v. Geneeskunde*, 1905, I, p. 177.

(2) **Ballantyne, A. J.—Case of metastatic sarcoma of optic nerve and retina.** *Transactions Ophthalmological Society* U.K., 1906.

(3) **Trousseau.—History of a palpebral epithelioma. (Histoire d'un épithélioma palpebral.)** *Ann. d'Oculistique*, T. CXXXIII, p. 5, janvier, 1906.

(4) Contino.—A further note on the origin of ocular dermoids. Ancora sulla genesi del dermoide oculaire.) *La Clinica Oculistica*, July, 1907.

(5) Paparcone.—An epibulbar melano-sarcoma. (Melano-sarcoma epibulbare. (Osservazione clinica e anatomica.) *La Clinica Oculistica*, July, 1907.

(6) Miller, G. Victor.—Two cases of gumma of the ciliary body. *Brit. Med. Journal*, July 13th, 1907.

(7) Dor, H.—Cyst of the lacrimal gland. (Kyste de la glande lacrymale.) *Revue générale d'Ophtalmologie*, 31 août, 1907.

(8) Sutherland, G. A. and Mayou, M. S.—Neuro-fibromatosis of the fifth nerve with buphthalmos. *Trans. Ophthal. Society U.K.*, XXVII (1907), p. 179.

(9) Wernicke, Otto.—Cysts of the sclera. (Cysten der Lederhaut.) *Arch. f. Augenheilk.*, Dezember, 1907, p. 23.

(10) Lauber, H.—A diffuse melanosarcoma of the conjunctiva with remarks on pigmented tumours of this structure. (Ein diffuses Melanosarcom der Bindehaut nebst Bemerkungen ueber die Pigmenttumoren dieser Membrane.) *Zeitschrift für Augenheilkunde*, Februar, 1908.

(11) Aurand, L.—Melanotic epithelioma of the caruncle. (Epithélioma mélanique de la caroncule.) *Revue Générale d'Ophtalmologie*, 30 avril, 1908.

(12) Marx, G.—A case of multiple neuro-fibromata. (Ein Fall von multipler neuro-fibromatose.) *Zeitschrift für Augenheilkunde*, Juni, 1908.

(2) Ballantyne's patient was a woman, aged 58, suffering from paresis of the right limbs and right side of face, divergent squint due to paresis of the left internal rectus, and blindness of the left eye. The ophthalmoscope revealed in the left eye a large creamy white mass covering the disc, and projecting above the level of the surrounding retina. The retinal vessels appeared to emerge from behind this mass, and there were some retinal hæmhorrages. Failure of vision had been noticed at least six weeks before admission to hospital, the weakness of the limbs being a later development.

Post-mortem, areas of softening were found in the brain in the posterior part of the corpus striatum on both sides, and in the upper part of the pons chiefly on the left side. Tumour-masses were found in and at the root of the left lung, in both suprarenals, in an abdominal lymph gland, and in the tissue of the abdominal wall.

Microscopically, all these masses were found to consist of cells with large, clear, oval, nuclei, showing a tendency everywhere to replace the cellular structure of the organs, while leaving intact

or causing proliferation of, the fibrous framework. Degeneration was found at the centre of most of the large masses. The same conditions were found in the optic nerve behind the lamina cribrosa, where all traces of the nerve structure had been destroyed. The mass in front of the lamina cribrosa consisted of two portions, a more bulky part (occupying the nerve-fibre layer) necrotic and a narrow, non-necrotic, zone surrounding the central vessels, and lying in contact with the choroid.

It is assumed that the tumour was primarily mediastinal, found its way through the wall of the pulmonary vein, and was carried as emboli to the other organs. The ocular growth probably started in the nerve behind the globe, passed through the lamina, and grew freely in the neighbouring retina. The mass occupying the nerve-fibre layer by its growth cut off its own blood supply, and underwent necrosis; while the posterior non-necrotic part continued to derive nourishment from the choroid and central vessels. A. B.

(3) **Trousseau** (Paris) relates the case of a lady, aged 68 years, suffering from a tumour of the lower lid. When first seen by him this had existed for eight years without treatment, and exhibited all the characteristics of an epithelioma. The patient refused operation, and was treated successively by: (1) antiseptics, (2) methylene blue, (3) chlorate of potash, (4) arsenic (method of Czerny). Each treatment produced an apparent cure, followed by a relapse, the last of which was accompanied by deeply-seated indurated nodules. Under *x*-rays, which were next tried, the superficial ulceration healed, but the deep lesions got worse, necessitating an extensive operation on the lids, orbital margin, and orbital contents, eight years after the patient was first seen. This was performed in October, 1904, and the immediate result was good. Trousseau is confident that a less extensive operation at an earlier date would have been followed by a permanent cure.

(4) **Contino** refers to two recent cases which he has had occasion to examine microscopically, and gives a detailed account of the findings. He draws special attention to the resemblance of the hair follicles of these little tumours to those of the lid margin and the caruncle, and from this adduces further evidence of his theory that ocular dermoids are due to adhesion of the lid margin to the globe. That such adhesions are really found, he shows by reference to a specimen in the collection of Professor Cirincione, an embryo of the eleventh week, in which the union between the lids and the globe is plainly shown in sections. As to the cause of such adhesion, he thinks that it cannot be inflammation, but local pressure. HAROLD GRIMSDALE.

(5) The patient, whose notes are here recorded, suffered from a large melano-sarcoma almost as big as the eye. The vision was normal, but the movements were greatly interfered with. When the eye was removed, a microscopic examination showed

that the deep structures were intact, although the growth was infiltrating the cornea. Its point of origin was probably the sclero-corneal junction, where there is normally some pigment.

HAROLD GRIMSDALE.

(6) **Miller** reports two cases of gumma of the ciliary body, in which the symptoms were almost identical, and included pus in the anterior chamber and cornea, and bulging of the upper ciliary region. It may be noted that the continued use of dionine in Miller's second patient appears to have determined the formation of bullæ on the cornea.

(7) The interest of **Dor's** case lies in its extreme rarity. (Desmarres with an immense *clientèle*, never saw one, and had to describe the condition from the writings of others.) In an infant at the age of two months, born, according to the parents, without any deformity, a swelling had appeared under the eyebrow at the supero-external angle of the right upper eyelid. At the age of three-and-a-half months, when seen by Dor, the eyelid was distended, exophthalmos was marked, the globe being also displaced downwards and inwards, and a tumour could be felt under the edge of the orbital arch. There was no fluctuation. It could be pushed somewhat into the orbit, but was itself incompressible. The position of the tumour favoured a diagnosis of lacrymal gland, but the exophthalmos was against it. The diagnosis actually made was tumour of the orbit, but at the operation a cyst presented and burst while being dissected out. The fluid was clear and colourless, and contained no hooklets, although these were carefully sought for. Microscopically, the cyst walls were formed of white and elastic fibres, and the interior contained large pieces of the gland itself. The author considers the cyst really to have been congenital—a retention cyst—since no traces of inflammation were found. ERNEST THOMSON.

(8) **Sutherland and Mayou's** patient, a lad six years of age—also shown on April 19th, 1907, at the Society for the Study of Disease in Children by Fletcher Beach as an example of "v. Recklinghausen's disease"—was exhibited at the Ophthalmological Society on June 17th, 1907. The affection dated from six months of age, and at about three years it was noticed that the right side of the face was larger than the left. On examination, the right side of the head was much more prominent than the left, due to the overgrowth of the cranial bones and of the soft structures of the right side of the face. The branches of the third division of the V nerve could be felt as so many cords. Right ptosis. A swelling, which felt like a bag of worms, present in outer part of upper lid. The globe was pushed downwards and forwards, but not to a great extent. Both lids were hypertrophied. The right eyeball was enlarged, the cornea measuring 15 mm. in the transverse direction. At the margin of the cornea, especially above, could be seen a number of white

streaks passing inward for 2 mm. or 3 mm. These probably represented enlarged ciliary nerves. Ectropion of the uveal pigment. Tension full. Disc cupped and of greyish colour. V.=fingers at two feet.

(9) **Wernicke** records a case of scleral cyst which he found causing a protrusion of the upper lid. The patient was a girl *ætat* $5\frac{1}{2}$ years. The cyst was kidney-shaped, 7 mm. long by 4 mm. wide, and extended forwards up to the margin of the cornea. The author removed the anterior wall of it, when the cyst was found to be filled with a clear fluid. A distinct depression in the sclera was left after the operation. The case appears to be the fourth of its kind recorded. PERCIVAL J. HAY.

(10) **Lauber** showed at the Vienna Ophthalmological Society in 1907 a woman, aged 33 years, who had a dark, brown pigmentation of the conjunctiva, affecting the lower lid, the plica semilunaris, the caruncle, the lower cul-de-sac, and much of the lower half of the ocular conjunctiva, extending to within 6mm. of the limbus. The pigment could be seen with Czapski's corneal microscope to lie in the superficial layers of the tissue. The condition had been developing for two years. The diagnosis lay between a nævoid growth and sarcoma. The patient wished the excision of a piece for examination to be deferred till after her confinement.

In a second case a foundryman, aged 44 years, a piece of hot metal struck his eye some years ago. After this he noticed a black patch on his eye which slowly increased in size. When first seen the whole of the ocular and palpebral conjunctiva was represented by a soft, black mass, which easily bled. Some of this black tissue was invading the skin at the lid margins and the limbus was infiltrated. The orbit was exenterated and both lids removed, the defect being made good by Kuster's plastic operation. The patient made a complete recovery, and after two years was free from any recurrence. Probably he is permanently cured, for conjunctival melanotic sarcomata have little tendency to give rise to metastases.

T. HARRISON BUTLER.

(11) **Aurand** (who remarks that tumours of the caruncle are rare, while epithelomata are rarities among the rare), reports a case of melanotic epithelioma of the caruncle which is only the fourth case reported of epithelioma and the second of melanotic epithelioma in this situation. A full microscopical account is given ; for this the original must be consulted.

ERNEST THOMSON.

(12) **Marx** (Strassburg) gives a full account of cases of multiple neuro-fibromata, the so-called Recklinghausen's disease, tabulates recorded cases, and adds one of his own. Recklinghausen showed that multiple fibromata, multiple neuromata, and plexiform neuromata were all expressions of the same pathological process, a fibromatous diathesis, manifested in different localities.

"The subcutaneous nodes show a distinct plexiform structure; they consist of strands of finely fibrillar, opalescent connective tissues rich in cells held together by ordinary loose connective tissue. Medullated and non-medullated nerve fibres, generally isolated, run among these strands." Neuro-fibroma of the eye and its annexa are sometimes associated with buphthalmos.

Marx's patient, a male, age 24, had a sister who suffered from plexiform neuroma of the thigh. When 11 years old he was stung by a wasp on the upper lid; the swelling never entirely disappeared. A year ago he received a blow from a piece of wood, and since then the lid has gradually thickened. The lids were much thickened on the right side, so that the eye was partly hidden. The swelling extended upwards to the brow, forming a large swelling. The eye was unaffected. Tumours were present in other parts of the body. The lid growth was successfully removed. The author thinks that the condition was due to the traumata, acting upon tissue having a family predisposition to form neuro-fibromata.

T. HARRISON BUTLER.

VIII.—THE OPHTHALMO-REACTION.

(1) **Brunetière.—Is there any danger in the ophthalmo-reaction. (L'Ophtalmo-réaction present-t-elle quelques dangers?)** *La Clinique Ophtalmologique*, 25 janvier, 1908.

(2) **Trousseau, A.—The dangers of the ophthalmo-reaction. (Les dangers de l'ophtalmo-réaction.)** *La Clinique Ophtalmologique*, 25 janvier, 1908.

(1) **Trousseau** (Paris) has been struck with the bad results which have sometimes followed the use of Calmette's test, and in very serious language questions the propriety of its application, except in cases when there is real difficulty in diagnosis. He refers to the caution advised by Comby and to Kalt's case (*see* THE OPHTHALMOSCOPE, July, 1908). He brings forward the following cases of which he has cognizance. A child who had recovered from an attack of phlyctenular conjunctivitis had a slight attack of bronchitis. The medical man employed the Calmette test, with the result that the conjunctival trouble was re-started. A girl suffering from conjunctival tuberculosis was made much worse and developed a tubercle of the iris after 0·5 per cent. tuberculin (Calmette). In another case, although there was almost no reaction, tuberculous iritis became much worse. A woman of 45, with double irido-choroiditis, developed a greater intensity of symptoms in the eye to which the test had been applied. In a case of double heredo-syphilitic keratitis, which had been practically

cured, the medical man, being doubtful of the nature of a joint swelling, used two drops of 1 per cent. tuberculin. Six days afterwards, the keratitis re-appeared in the eye which had received the tuberculin, the cornea became vascularized, and vision was abolished; two months later there was no improvement, but the other eye remained intact. ERNEST THOMSON.

(2) **Brunetière** (Bordeaux) does not seem to take such a serious view of the published mishaps after the ophthalmo-reaction as that of Trousseau, quoted above. The cases which he cites will be found in the review on the subject published in THE OPHTHALMOSCOPE, July, 1908. Brunetière follows Darier in suspending judgment. ERNEST THOMSON.

IX.—THE SURGICAL TREATMENT OF CONCOMITANT STRABISMUS.

Kuhnt, H.—On the operative treatment of concomitant squint. (Ueber die operative Behandlung des konkomitierenden Schielens.) *Zeitschrift für Augenheilkunde*, September, 1908.

Kuhnt (Bonn) chose squint operations as the subject of a paper read before the congress of ophthalmic surgeons practising in Rheinland and Westphalia. He remarked that the number of partial or total failures which every operator must meet with renders it profitable to discuss the value of the different procedures advocated and practised for the cure of squint. Conservative methods, as is well known, are restricted to cases in which the angle of the squint is small. Surgical interference must generally precede orthoptic treatment. When muscular equilibrium has been attained by tenotomy and advancement on one or both eyes, then treatment with the diploscope and the stereoscope may be regarded as useful adjuncts. It is a matter of complete indifference whether we regard strabismus as due to relative shortness of the muscle on the side to which the eye verges, to a defect in innervation, or to a pre-existing spasm of one of the muscles. Our aim in all cases must be to place the eye in a position of muscular equilibrium.

Simple tenotomy, on account of the ease with which it can be performed, and the trivial nature of the operation and its after-treatment, has been widely adopted; but its vogue is now waning. The effect of a tenotomy depends upon three factors:—(1) the anatomical construction of the tendon, the extent of its lateral branches, and the nature of their attachment to Tenon's capsule; (2) whether the tendon alone be divided, or whether Tenon's capsule is opened, and if so to what extent; and (3) the vital functions—power, tone, and innervation.

The factors included under the first head vary enormously in different individuals, and in specified cases can never be accurately gauged. It is obvious, therefore, that the effect of an ordinary tenotomy can never be foreshadowed or graduated. Viewed from a common-sense standpoint, tenotomy has, as Landolt points out, little to recommend it. We produce a paresis or even a paralysis of a muscle on one side with the object of strengthening the antagonistic muscle, which is too weak. We may produce diplopia, false projection, and restricted movement of the eye, with accompanying contraction of the visual field.

The end and aim of a squint operation is not only to produce parallelism of the visual axes, but also to obtain binocular vision. This is not attained by simple tenotomy, after which the excursion limits of the agonist often fall below the normal, while those of the antagonist improve but very slightly. In many cases a tenotomy of the internal rectus, even when the cosmetic effect is good, is followed by insufficiency of converging power and crossed diplopia, which render near work difficult if not actually impossible. If the muscle retract too much after a tenotomy, a squint in the opposite sense may sooner or later develop.

A rational operation must not be a paralysing tenotomy, but an invigorating advancement of the weak muscle. Landolt points out that if we work in this direction, we not only "put eyes straight," but, what is quite a different thing, we "cure squints." Kuhnt is so convinced of the unsatisfactory results of a simple tenotomy and of the advantages of advancement that he rarely performs the former operation. He prefers a double advancement to a combined advancement and tenotomy.

Kuhnt lays great stress upon the necessity of more than one examination before any surgical interference is decided upon. This is especially desirable in the case of children, and also when the squint measures less than 15°. A full correction, ordered after the prolonged use of atropine, should be worn for some time, and the non-squinting eye should be kept under atropine. If the child be intelligent, orthoptic treatment may be tried. Should these measures fail to reduce the strabismus angle, Kuhnt, in cases where the degree is moderate, that is, between 15° and 25°, partially corrects the error by advancement. If the squint is a bad one, and yet both eyes have good or sufficient visual acuity, he prefers to advance both external recti, dividing the effect between the two eyes. He first operates upon the squinting eye, correcting a little more than half the deformity, and then, after a time, attacks the second eye. But if both be done at once, the result, as a rule, is equally good. If double advancement be insufficient to produce parallelism, then Kuhnt performs a variety of tenotomy of which the effect can be graduated. It is undesirable to disturb the attachmen tof the tendon with Tenon's capsule, and in consequence a squint hook should not be introduced. Nor should Tenon's capsule be incised,

either at the edge of the tendon or elsewhere. For we have no means of guessing the effect of such a proceeding which is but a step in the dark.

Kuhnt performs the operation as follows: a vertical incision, from 10 mm. to 12 mm., is made in the conjunctiva over the

Fig. 1.

insertion of the tendon. The conjunctiva is dissected back until the belly of the muscle becomes visible, and its insertion is exposed. The tendon is now seized in the middle of its insertion,

Fig. 2.

and a buttonhole 3 mm. to 4 mm. broad is made, $\frac{3}{4}$ mm. to 1 mm. from the sclera (*see* Fig. 1). Then, with a strabismus hook, one explores the buttonhole and ascertains that it is accurately centred in the tendon. One branch of a fixation forceps with horseshoe-shaped extremities* (Fig. 2) is next passed through the buttonhole. The forceps has one or two tenaculum hooks at the ends, which take a firm grip on the tissues. One branch is furnished with a millimetre scale, and it is thrust in the buttonhole to a depth which is proportionate to the desired extension of the tendon,

*Made by Palm, Königsburg.

and the forceps are closed. Then, the tendon is divided close to the sclera, and with it the capsule of Tenon to an extent of 3 mm. to

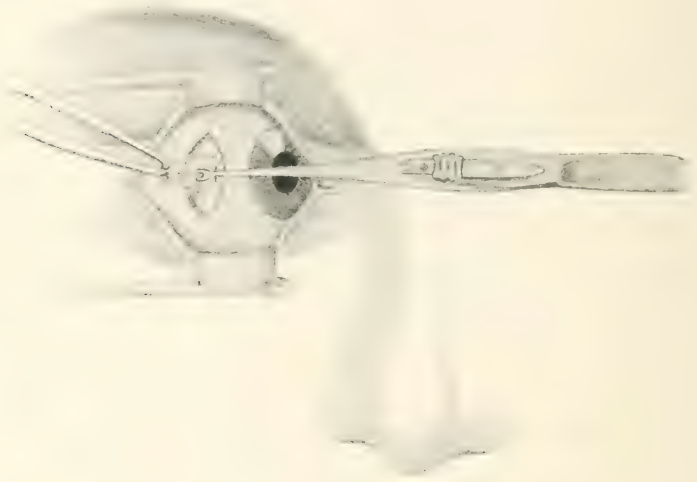


Fig. 3.

5 mm. The tendon must now be seized with forceps, as in Fig. 3, raised a little, and snipped transversely exactly behind the horseshoe, a second buttonhole being formed. This buttonhole is extended longitudinally on each side of the horseshoe, isolating a little tongue of tendon. At each side a bridge about 1 mm.

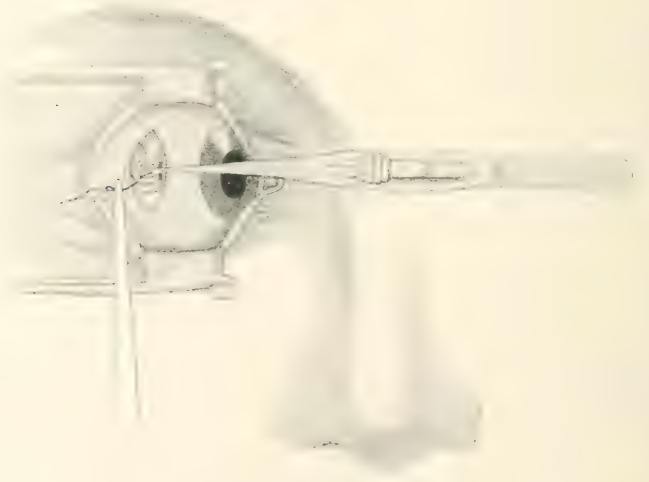


Fig. 4.

wide is left. Now, a double-armed suture is passed through the tongue, as in Fig. 4, and then both ends are passed through the

remains of the tendon left on the sclera and also through the conjunctiva and tied together, as in Fig. 5. In this simple

Fig. 5.

manner the central part of the tendon is utilised to lengthen the whole tendon.

If a second operation is to be performed upon a squinting eye,

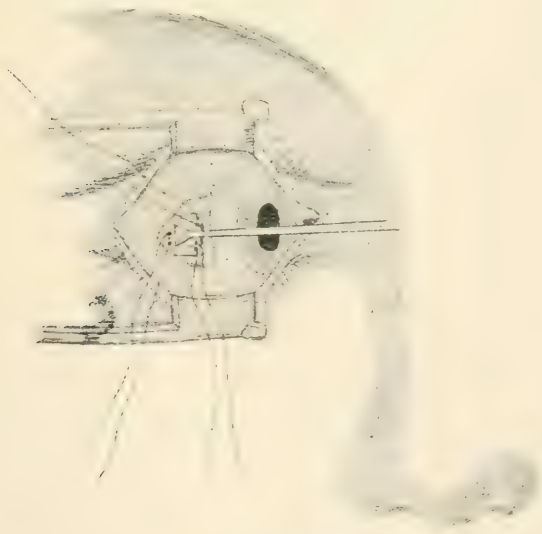


Fig. 6.

there should be an interval, amounting to several months, between the two procedures, until the final effect of the first has been ascertained.

Kuhnt thinks that the resection of the anterior end of a muscle in advancement is not a rational procedure, since the muscle is left in tension, the stitches are apt to cut out, and the muscle is apt to retract; the operation thus fails in its purpose or succeeds only partially. It is also essential to obtain a broad adhesion. To attain these ends he performs a muscle-capsular advancement as follows:—the operation commences as in the procedure just described. Greven's speculum is used, as it has no hooks to catch the sutures (Lang's instrument possesses the same advantages). The incision is a little longer, 12mm. to 15mm. The same button-hole is made, and a branch of an ordinary fixation forceps introduced and clamped. The tendon is cut loose from its insertion, and three double-armed sutures are passed, as in Fig. 6. The forceps can now be removed. With the two lateral threads the tendon is gently drawn out and split down the centre with straight scissors, as shown in Fig. 7.

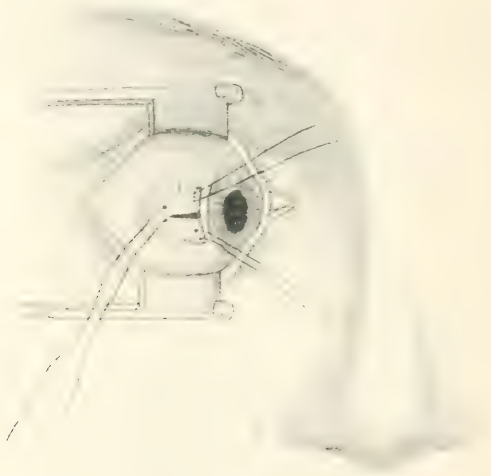


Fig. 7.

If the neighbouring capsule of Tenon is to be advanced as well, Kuhnt passes his hollow strabismus hook under the capsule from above and below, and passes a double-armed suture 3 mm. from the edge of the tendon, and then separates the capsule from the sclera close to its insertion. These stitches can be seen in Fig. 8. All these sutures should be respectively clamped in a numbered clamp to avoid confusion. The sclera is slightly scarified to help the adhesion of the tendon-ends. Kuhnt seizes the sclera with crowbilled scleral forceps (obtainable from Palm, Königsberg i. Pr.-"Skleralpinzetten") and passes his sutures not meridionally but vertically parallel to the corneal margin (as shown in Fig. 8) first through the sclera and then through the pericorneal

flap of conjunctiva. The sutures can now be tied—first, the central; then, the lateral tendon threads; and, finally, the capsule stitches. They are first tied in loops, and if the result be good, finally knotted. No conjunctiva must be removed. Both eyes to be bandaged for 6-7 days. In 8-10 days the stitches can be removed.

Fig. 8.

To produce only a slight shortening, the author performs a tenodectomy. He removes a semicircular piece from the centre of the tendon, and sutures the posterior wound margin to the insertion, as in Fig. 9. The effect is equal to about 10° of

Fig. 9.

vergence. Kuhnt has found simple capsule advancement unsatisfactory. Folding of the muscle leads to no permanent shortening; it generally relapses to its old position. If the capsule be advanced and the muscle folded, however, the combined result is better. T. Harrison Butler.

X.—REMEDIES.

(1) Bocchi, A.—Contribution to the therapy and to the pathological anatomy of primary melanosarcomata of the ocular adnexa. *Annali di Ottalmologia*, Vol. XXXVI 1907), fasc. 6 to 8, p. 612 to 623, with four figures.

(2) Leplat, L. -Acute glaucoma produced by eserine and cured by atropine. (Un glaucome aigu produit par l'éserine et guéri par l'atropine.) *La Clinique Ophtalmologique*, 10 février, 1908.

(3) d'Allessandro, L.—Tuberculosis of the iris diagnosed and treated by tuberculin. (Tuberculose de l'iris diagnostiquée et traitée par la tuberculine.) *La Clinique Ophtalmologique*, 25 février, 1908.

(4) Napp, O.—A short report upon the trials made in the Ophthalmic Klinik of the University of Berlin with the Deutschmann Heilserum. (Kurzer Bericht ueber die in der Berliner Universitäts-Augenklinik gemachten Erfahrungen mit Deutschmannschen Heilserum.) *Zeitschrift für Augenheilkunde*, Juli, 1908.

(4A) Caravia, Eugene.—Note on Deutschmann's serum against infectious disease. *Medical Record*, July 18th, 1908.

(5) Hansell, Howard F.—Diaphoresis in the treatment of internal ocular affections. *Pennsylvania Medical Journal*, August, 1908.

(6) Corser, John B.—The treatment of recent injuries to the eye by penetrating pieces of steel. *Pennsylvania Medical Journal*, August, 1908.

(7) Brose, L. D.—The treatment of some forms of lens displacement other than those of traumatic origin. *Journal American Medical Association*, August 8th, 1908.

(8) Bailliart, P.—Treatment of intra-ocular hæmorrhages. (Traitement des hémorrhagies intra-oculaires.) *Bulletin Général de Thérapeutique*, 30 septembre, 1908.

(9) Robin, Ernest A.—(New Orleans, Louisiana, U.S.A.).—The uses of dionin in diseases of the eye. *New Orleans Medical and Surgical Journal*, October, 1908.

(10) Clarke, Ernest and Wright, Sir Almroth.—Solitary or conglomerate tubercle of the choroid treated by tuberculine *Transactions Ophthalmological Society U.K.*, Vol. XXVIII, 1907-8.

(11) Clarke, Ernest, and Mayou, Stephen.—Confluent or conglomerate tubercle of the iris treated by tuberculin. *Transactions Ophthalmological Society U.K.*, Vol. XXVIII, 1907-8.

(12) Mackay, George.—Note on a case of phlyctenular keratitis and pustular episcleritis treated by staphylococcic injections. *Transactions Ophthalmological Society U.K.*, Vol. XXVIII, 1907-8.

(13) Cantonnet.—Formulæ of collyria isotonic with the tears. (Formules de collyres isotoniques aux larmes.) *Archives d'Ophtalmologie*, octobre, 1908.

(14) Bailliart, P.—Some cases of ocular infection treated with anti-diphtheritic serum. (Quelques observations d'infection oculaire traités par la sérothérapie antidiphtérique.) *La Clinique Ophtalmologique*, 25 octobre, 1908.

(15) Bailliart, P.—Serum therapy in ophthalmic work. (La séro-thérapie en ophtalmologie.) *Bulletin Général de Thérapeutique*, 15 octobre, 1908.

(16) Posey, William Campbell.—Miotics versus iridectomy in the treatment of simple chronic glaucoma. An analytical study of sixty-five cases treated by miotics over a series of years. *Journal American Medical Association*, October 24th, 1908.

(17) Fergus, Freeland.—Headache and ocular treatment. *Glasgow Medical Journal*, November, 1908.

(1) The two observations of **Bocchi** (Cremona) are in support of the relative benignities, from the clinical point of view, of melanotic tumours of the conjunctiva, and even of the anterior portion of the orbit. This benignity contrasts with the malignant characters (relapses, early metastasis or invasion of the surrounding parts) of melano-sarcomata of the uveal tract (mean mortality 75 per cent.). The question of the origin of the pigment of the melanosarcomata, which one would desire to bring into relation with their characteristics of benignity or malignancy, is still far from settled. The few researches of the author have given him contradictory results. A. ANTONELLI.

(2) **Leplat** (Liège) gives the incomplete history of a patient to whom he was called. He found that the patient had had pain and redness of one eye, which had been already relieved by atropin, applied by her medical man. The patient, however, objected to the effect of atropin, because it prevented her from reading. Leplat used eserine and was soon called in again, and on this occasion, a few hours after the first, the patient had acute glaucoma. "*J'étais absolument désorientée. Que faire dans un*

cas aussi anormal ?" Leplat used atropin and saw the patient professionally once again, that same evening, when he found matters improving; but she passed into the care of another practitioner, so that Leplat was unable to complete his observation at first hand, but she died, it was reported to him, totally blind from double glaucoma, eleven years later. As may be gathered from the quotation given above, the author is totally unable to explain the case. He gives a reference (which he has not looked up) to the *Lancet*, No. XI, 1882, Knight, "Two cases of increased eyeball tension, one reduced by eserine, the other by atropine"; also to an article by Schoute (*Medizinische Revue et Jahresb. des* 1902. *Sic !*) ERNEST THOMSON.

(3) No less than twelve columns of *La Clinique Ophtalmologique* are occupied by **d'Allessandro** (Naples) in describing what is undoubtedly an interesting case of not very rapidly progressive tuberculosis of the iris cured—so far as it could be cured—by tuberculin. The case was one which was seen early and diagnosed early, but the surgeon lost sight of the patient for a month. At the end of that time the condition had become so much more marked that, in consultation with Angelucci, enucleation was decided upon. But the parents refused absolutely to allow removal of the eye. It was at this juncture that d'Allessandro, being sceptical of the curative value of tuberculin, but having tried every other likely treatment without avail, decided to use tuberculin. In the course of a year various tuberculins were employed, as detailed at great length in the article, but, to make the story short, it may be said that Koch's tuberculin T.R., was found to be the best; and that at the end of a year the tuberculous mass had entirely disappeared, leaving cicatricial tissue in its place. The patient, a girl of thirteen, was in good health, and had slight vision in the eye, the tension of which was normal. A short bibliography is appended.

ERNEST THOMSON.

(4) In THE OPHTHALMOSCOPE for December, 1907, Deutschmann's paper upon his *Heilserum* was fully abstracted, and his claims were set forth and discussed. We then expressed ourselves as somewhat sceptical with regard to the therapeutic value of the serum, basing our opinion upon a critical study of the cases recorded by Deutschmann himself. **Napp** now gives us the results of the extensive trials which have been made at Berlin. They can be summarized in his own words. "The serum, with the exception of the production of harmless exanthemata, has no bad effect upon the human body, but we were not able to decide that it exerted any therapeutic action upon the eye diseases for which it was employed." T. HARRISON BUTLER.

(4A) Deutschmann's serum, as now well known, is a polyvalent serum neutralising germs of all kinds, and obtained from the blood of animals fed upon increasing doses of sterile yeast for a definite period. It is neither bactericidal nor

anti-toxic. **Caravia** (New York) writes enthusiastically about the novel product. He relates a number of eye diseases successfully treated with the Deutschmann serum, including septic wound of the globe, rheumatic iritis, acute purulent irido-cyclitis, ulceration of cornea following a burn, phlyctenular pannus, and post-operative irido-cyclitis in a diabetic subject. In five of the six cases mentioned no remedy was applied except the serum, while in the sixth case, one of iritis, atropine was used to keep the pupil dilated and warm poultices to relieve pain. In addition to the foregoing, serum employed in "a series of difficult cases of so-called hypopyon-keratitis healed rapidly with very slight corneal opacity." Much of the communication is devoted to the action of the serum in cases of pneumonia, several temperature charts being given. Reports of the action of the serum in cases of tonsillitis, measles, scarlet fever, faucial diphtheria, and abscess in the gluteal region are given. In conclusion, says Caravia, "judging from the results already obtained, it can be said that in Deutschmann's serum, we have a valuable theurapeutic agent which is destined in the course of time to take a prominent place in the everyday practice of those who object to the depressing effects of other agents."

SYDNEY STEPHENSON.

(5) As the result of a very broad and successful experience, **Hansell** (Philadelphia) reiterates his belief in the efficacy of combining diaphoresis with the other ordinary forms of general therapy in internal ocular affections. His present method of practising it is to place the subject upon a rubber sheet and to envelop him in three thick blankets in which, and as near the patient's body as possible, are placed a number of receptacles filled with hot water. The patient is given a cup of hot fluid, preferably tea, to drink. A glass of iced water, one hour after the process has commenced, will, he says, serve to stimulate the sweat glands and to increase the sweating. Any sense of discomfort and fulness in the head may be relieved by the use of an ice cap. The duration of the process should not exceed an hour and a half. At the conclusion of the treatment, the patient's body should be well dried and rubbed with alcohol. Clean, dry clothing and bed coverings should be used, and the patient must be made to rest quietly for a period of several hours. Carefully noted body temperatures taken a few hours after each sweating offer trustworthy guides as to the duration and the frequency of the method, and are of value, besides, for the determination of the necessity for stimulation. CHARLES A. OLIVER.

(6) For the following reasons, **Corser** (Scranton, Pa.) properly advises the immediate removal of such bodies; prolonged irritation is avoided, and inflammatory exudates and adhesions are not given time to form. The body may be removed through the wound of entrance; the danger of a subsequent operation, requiring opening of the globe, is avoided; and such

patients, "who are nearly always breadwinners," are saved the added loss of time required by delayed removal.

CHARLES A. OLIVER.

(7) **Brose** (Evansville, Indiana) classifies such cases into four groupings. For the first, which embraces those in which treatment is sought either to improve existing vision or to prevent grave secondary disease, he considers the advisability of correcting lenses, and the preferences for the performance of optical iridectomy, discission, and extraction. In the second, which includes those in which the lens has become cataractous, he limits his procedures to discission and extraction. In the third, which embraces cases of congenital lens displacement complicated with acute glaucoma, he performs either simple iridectomy or combined extraction. For the last, which includes only displaced cataractous lenses secondary to acute glaucoma, he has recourse to extraction with preliminary iridectomy, or preliminary sclerotomy if intraocular tension is increased. CHARLES A. OLIVER.

(8) **Bailliart** deprecates the purely constitutional treatment of intra-ocular hæmorrhage. Intra-ocular hæmorrhage should not be regarded solely as a symptom ; treatment should be local as well as general. After enumerating the causes or predisposing causes of various forms, adolescence, arterio-sclerosis, hypertension, venous or arterial thrombosis of retinal vessels, leucæmia, albuminuria, diabetes, syphilis, the author proceeds to discussion of treatment. Ergotinine is likely to do more harm than good. Injections of gelatinized serum are recommended. The local and general use of pilocarpine, local and general derivation, and subconjunctival injections of cyanide of mercury are all useful.

ERNEST THOMSON.

(10) **Clarke and Wright** (London) report a case which gave rise to considerable discussion on account of the fact that a tumour of the choroid which cleared up under tuberculin injections was the only discoverable tuberculous focus. The patient was a thoroughly healthy-looking schoolboy of 14 years, who came under Clarke's care on account of failure of vision of the left eye. A whitish, oval-shaped, sub-retinal prominence of 3D. was seen on the nasal side of the macular region. The disc and neighbourhood showed marked œdema and congestion and blurring. None of the accessible lymph glands were enlarged, and there was no history of tubercle or syphilis. Vitreous opacities developed, and keratitic deposits were seen in the usual situation. The diagnosis of tubercle was agreed in by R. M. Gunn and Sir John Tweedy. Treatment by tuberculin was undertaken by Sir Almroth Wright. Punctate keratitis became less, but vitreous opacities increased during the next few months, and V.A. deteriorated. Six months after the commencement of treatment, V.A. improved, vitreous became clearer, and punctate keratitis disappeared. The growth was

now seen to be much flatter than at first. About eighteen months after the commencement of treatment, there were no vitreous opacities, no punctate keratitis, V.A. was $\frac{6}{9}$ (it had been down to $\frac{6}{36}$). A large atrophic patch bordered by pigment, and showing a string of small white spots on its upper border, bore a remarkable resemblance to Sydney Stephenson's case of obsolescent tubercle of the choroid figured in plate X, Vol. I, of the *Reports of the Society for the Study of Disease in Children.*

As a "second string," Clarke, with the approval of Gunn and Tweedy, but somewhat against Wright's wishes, employed mercury and iodide, as well as tuberculin. The eye was kept under the influence of atropin.

Wright, in his notes on the case, says that the low opsonic index of 0·66 pointed almost conclusively to a tuberculous affection. Twenty-one inoculations were given within the year, and further inoculations at intervals of three months.

Clarke's final note (April, 1908, twenty-one months after commencement of treatment) states that the boy, as far as could be ascertained, was well and sound. "Although the absence of a pathological examination may prevent some from being absolutely positive that the growth was tubercular, the opsonic index and the reaction to tuberculin, as well as the clinical picture of the case, can leave very little doubt, if any, that the diagnosis was correct; and the special interest in this case lies in the fact that this diagnosis has, as far as we can at present tell, enabled us by treatment to drive the tubercle out of the system, and not only have we been able to save the eye, but it is now for all practical purposes a normal eye."

In the discussion, Jessop doubted the diagnosis of primary tubercle of the choroid, and appeared to question the value of the tuberculin treatment; because (1) cases of ocular tubercle may get well with cod-liver oil and open air, and (2) mercury was used. J. H. Fisher reported a case of choroidal tubercle cured by tuberculin and he also criticised the diagnosis in Clarke's case on account of (1) its duration; (2) the use of antisyphilitic drugs. Sydney Stephenson thought that the presence of vitreous opacities was, *pace* Jessop, no bar to the diagnosis of tubercle; and R. R. Cruise referred to a case of tuberculous choroiditis, with lupus of the face, in which there was extensive vitreous exudation.

Clarke in his reply said it was a very difficult thing to disprove the existence of quiescent pulmonary tubercle. Even if there had been no case recorded of primary choroidal tubercle, he did not see why such should not occur. ERNEST THOMSON.

(11) **Clarke** and **Mayou** (London) have treated successfully with tuberculin T. R., a boy of three years, who presented a group of nodules of various sizes on the lower margin of the right iris, bleaching of the iris, with many new vessels

on its whole surface, and keratitis punctata. The vitreous was clear. After a week of observation, during which he received hydrarg. c. cret. and cod-liver oil, the nodules having increased, $\frac{1}{1000}$ m. gr. tuberculin was inoculated. There was definite local reaction and an increase in the size of the nodules and in the keratitis punctata. A week later there was improvement; opsonic index raised from .45 to 1.00; nodules smaller. Another $\frac{1}{1000}$ m. gr. tuberculin given. About three weeks later the patient was discharged and as an out-patient was given $\frac{1}{1000}$ m. gr. tuberculin every two or three weeks. Calmette's test was positive. Nine months after commencement of treatment, all the nodules had disappeared. There were anterior and posterior synechiæ and the lens had become opaque. The authors think this last complication was due to rupture of the lens capsule by the softening influence of the tubercle. The bleached colour of the iris had disappeared. Beyond grey powder for one week and cod liver oil for three weeks, no other treatment, except the tuberculin injection, was adopted.

ERNEST THOMSON.

(12) **Mackay** (Edinburgh) has followed out for ten years a case which at the beginning appeared to be of the ordinary "strumous" phlyctenular type, but which after repeated relapses and recrudescences, developed into a more severe pustular type, which led to the suspicion of tubercle. There was, however, a very marked positive phase, as the result of an injection of tuberculin, in March 1907. This fact and the absence of tubercule bacilli in films taken from the conjunctiva appeared strongly to contraindicate tubercle. The staphylococcic index was then taken, and found to be 1·69. Injection of $\frac{1}{500}$ m.g., of dried staphylococcus aureus, dissolved in 1 c.c. of distilled water, resulted in *negative phase*, the index falling to 0·92. The injections were repeated and the patient's condition improved to such a degree that Mackay decided to report the case to the Society. Before he could do so, however, there was a relapse, so that, to a certain extent, the result is inconclusive. The author, however, does not seem to have any doubt that the opsonic index enabled him to distinguish between tuberculous and staphylococcic infection, since the amelioration under staphylococcic inoculations was so marked. That it had not, at the time of reporting the case, succeeded in curing the patient, might be due to the fact that she had been allowed to go three months without an inoculation. It should be said that the patient was a girl of 14 when first seen in 1898, that her parents were related before marriage, and that she had some phthisical relations.

ERNEST THOMSON.

(13) In a former communication* **Cantonnet** (Paris) has shown that in order to be well borne, a lotion should possess a

*THE OPHTHALMOSCOPE, July 1908, p. 550.

degree of molecular concentration equal to that of the fluid which normally bathes the particular mucous membrane to which the remedy is to be applied. As regards the conjunctiva, such a solution is to be found in saline, containing 14 grammes of sodium chloride to a litre of distilled water, or, in other words, a 1·4 per cent. solution. Cantonnet has now determined the formulæ of solutions isotonic with the tears by comparing the freezing point of such with that of the 1·4 per cent. saline (0°·86 to 0°·87). He has added to the solutions commonly employed in eye work such a quantity of sodium chloride as was necessary to cause freezing at approximately the same point as the 1·4 per cent. saline. He has, in fact, regarded as isotonic any collyrium, the freezing point of which lay between 0·80 and 0·90. As regards solutions of cocaine, stovaine, dionine, pilocarpine, and atropine, Cantonnet has found that the added sodium chloride always remains the same for a given concentration, irrespective of the substance. This fact is shown in the following table :—

Collyria of	4	per cent.	are to be made with saline of	6 : 1,000
,,	2	,,	,,	,,	10 : 1,000
,,	1	,,	,,	,,	12·5 : 1,000
,,	0·5	,,	,,	,,	13 : 1,000
,,	0·20	,,	,,	,,	13·5 : 1,000

The formulæ which follow refer to some of the more important organic salts of silver :—

Collargol	0 gr. 20	
Sodium Chloride	0 gr. 10	= Δ —0·68
Water	10 gr.	
Collargol	0 gr. 10	
Sodium Chloride	0 gr. 125	= Δ —0·78
Water	10 gr.	
Argyrol	0 gr. 10	
Sodium Chloride	0 gr. 125	= Δ —0·83
Water	10 gr.	
Protargol	0 gr. 10	
Sodium Chloride	0 gr. 125	= Δ —0·75
Water	10 gr.	

Silver nitrate and zinc sulphate being incompatible with sodium chloride, could not be examined from the isotonic point of view. SYDNEY STEPHENSON.

(14) **Bailliart** gives particulars of four cases of ocular infection treated with anti-diphtheritic serum. The cases were : 1. Irido-cyclitis after discission of secondary cataract (two injections each of 10 c.cm.) ; 2. Irido-cyclitis following extraction of senile cataract (three injections each of 10 c.cm.) ; 3. Intense suppurative irido-cyclitis after cataract extraction (four injections each of 10 c.cm.) ; 4. Hypopyon-keratitis of traumatic origin (two injections each of 10 c.cm.).

In the first and second cases, which ended in cure, no remedy except serum was employed. In the third case, although the inflammation was subdued, yet perception of light was lost. The employment of the serum, however, rendered removal of the eye unnecessary. In the fourth case, one of hypopyon-keratitis, the ulcer was cauterised and atropine instilled into the eye, and serum was used only when those measures seemed likely to fail. After optical iridectomy, vision was 6/10 or 7/10. On the whole, the result of treatment by serum was very striking. As Bailliart points out, one advantage of serotherapy is that if it sometimes fails to cure, at all events, it never does the least harm. SYDNEY STEPHENSON.

(15) **Bailliart** writes a perfectly reasonable, and at the same time short, article on the use of Roux serum in: (1) infected wounds, of which the type is hypopyon-keratitis, and (2) post-operative infections. An injection or two of 10 c.c. of the serum does no harm—though we are cautioned against accidents, always slight, such as erythema, articular pains, fever—and often does a great deal of good. The writer admits candidly that rapid cures are often spontaneous, and not necessarily due to the serum, but still the last-named ought to be employed.

ERNEST THOMSON.

16, **Posey** (Philadelphia) emphasizes his belief that miotics should be relied upon as the sole means of treatment only in those cases that are free from attacks of so-called "glaucomatous congestion," the presence of which constitutes the chief indication for iridectomy. He believes that to gain the full benefit of miotics, it is necessary that they be administered properly. He begins with doses sufficiently small to avoid spasm of the ciliary muscle, and rapidly increases their strengths and frequency until the pupil of the affected eye is markedly contracted—this degree of contraction being maintained as long as life lasts. Conjunctival irritation, he says, may be avoided by employing fresh and sterile solutions of the drugs. In all cases, suitable cleansing washes should be used, and attention must be given to the general health of the subject, especially to the condition of the blood-vessels. Careful and repeated correction of any refraction error should be made, and restrictions regarding the use of the eyes must be enjoined. CHARLES A. OLIVER.

(17) **Fergus's** communication is on the usual lines of such papers addressed to general medical audiences. It differs, however, from many such articles in its breezy style and freedom from tedious detail. Towards the end of the article the author repeats the charge which he has often made before, namely, that some ophthalmic surgeons are insufficiently educated. "To my way of thinking a man cannot read the best books on the higher but essential parts of ophthalmology unless he has a good knowledge of plane trigonometry, and is familiar with some of the ideas contained in the calculus." One can only say about this

statement that there may be differences of opinion as to what constitutes the "higher parts of ophthalmology," and that whatever may be the advantages of a knowledge of mathematics, and they are undoubted, a great many men whose minds are non-mathematical make excellent ophthalmic surgeons.

ERNEST THOMSON.

XI.—MISCELLANEOUS.

(1) Blok, D. J.—New formation of blood-vessels in the vitreous. (Vaatvorming in het glasvoaht.) *Ned. Tijschrift v. Geneeskunde*, 1904, II, p. 723.

(2) Viciano.—A contribution to the study of metastatic panophthalmitis. (Contribucion al estudio de la panoftalmia metastasica.) *Arch. de Oftal.*, October, 1904.

(3) Paon.—The mechanism of traumatic tearing and sub-conjunctival dislocation of the lens Pathological anatomy and pathogeny. [Méchanisme de la déchirure et de luxation sous-conjonctivale du cristallin d'origine traumatique, anatomie pathologique et pathogénie.] *Ann. d'Oculistique*, T. CXXXII, p. 330, novembre, 1904.

(4) Uribe Troncoso.—Experimental investigations on the filtration of liquids, both saline and albuminous, through the anterior chamber, and the relation to the origin of glaucoma. (Investigaciones experimentales acerca de la filtracion de liquidos salinos y albuminosos a traves de la camara anterior, y su papel en el genesis del glaucoma.) *Anales de Oftalmologia*, Enero y Febrero de 1905.

(5) Delord, E.—A rare complication of iridectomy. (Complication rare à la suite d'une iridectomie.) *Bull. et Mém. de la Société Française d'Ophtalmologie*, T. XXIV, 1907, p. 619.

(6) Tertsch, R.—A contribution to the formation of anterior polar cataract. (Ein Beitrag zur Entwicklung der vorderen Polarcataract. von Graefe's *Archiv f. Ophthalmologie*, Bd. 66, 3, 17 September, 1907.

(7) Twietmeyer, J.—Cases illustrating the formation of macular holes. (Zur Kasuistik der zentralen Lochbildung.) *Zeitschrift fur Augenheilkunde*, November, 1907.

(8 Marx.—On the prognosis of retrobulbar neuritis and toxic amblyopia. Beitrag zur Prognose der Neuritis retrobulbaris und der Intoxicationsamblyopie.) *Arch. f. Augenheilk.*, Dezember, 1907, p. 28.

9 Milian, G.—Three signs for the diagnosis of erysipelas. *Medical Press and Circular*, October 14th, 1908.

(1) **Blok** describes two cases in which after a choroiditis (syphilitic), a new formation of vessels, protruding into the vitreous, took place. G. F. ROCHAT.

(2) Metastatic panophthalmitis does not often come under the notice of an ophthalmic surgeon until the eye is hopelessly lost, because the general disease of which it is a part is, as a rule, of overshadowing importance. **Viciano** has had the opportunity to see three cases in children, of whom two recovered. The two first-mentioned followed slight gastric disturbances which had occasioned no anxiety in the minds of the parents. The eyes were much inflamed; there was hypopyon, much swelling of the lids, and chemosis of the conjunctiva. The treatment was a daily application of silver nitrate (4 % solution) and atropine. In two cases the hypopyon soon disappeared, and the vision was restored; in the third the patient, who was very ill, did not attend the clinic long, and the result is not known. Viciano considers that the disease was probably due to the bacillus coli communis, which had caused the gastric trouble as well as the more severe complications. HAROLD GRIMSDALE.

(3) **Paon** found the following conditions in an eye removed for panophthalmitis following a blow of a fist: (1) a wound of the sclerotic, six mm. long, almost parallel to the edge of the cornea and situated with its centre opposite to the horizontal meridian; (2) suppurative choroiditis; (3) complete disorganisation of the zonule, capsule, and iris with division of the lens into lateral halves, the internal of which remained in its normal position, and was united by a fine bridge with the external, which, pivoting round its inferior extremity, became anterior, and presented in the scleral wound by its anterior edge, and not by its superior border, which was clearly seen behind the deep surface of the sclerotic. The mechanism by which such lesions are produced and the treatment applicable to their various degrees are discussed at length. R. J. COULTER.

4 In these investigations **Troncoso** made use of the filtration-manometer devised by Leber, which allows more accurate measurement than the more simple apparatus used by Priestley Smith. By this means it is easy to measure accurately the fluid which enters the eye; a great part of this, however, serves only to distend the eye after death, and the increase of weight of the eye must be taken into account to find the true amount which has passed through the filtration angle. When the fluid

employed contains albumen, the amount which passes through the anterior chamber is much reduced, and if the experiment be continued for several hours, the filtration may cease entirely, since the albumen tends to collect in the anterior chamber, and the escaping fluid has a smaller content of albumen than the entering. Most experimenters have obtained far too high figures for the filtration, because they have neglected the important fact, pointed out by Priestley Smith, that the pressure in the vitreous has marked bearing on the flow. If the pressure in the vitreous chamber be kept equal to that in the aqueous, the outflow is reduced to half that which can be observed if the pressure be increased in the aqueous only. Further, if the pressure in the vitreous be raised above the pressure in the aqueous, the filtration very soon ceases. Troncoso calculates the amount filtered through the anterior chamber in the living eye as about 1·6 cubic millimetres. He lays considerable stress on the change of composition of the aqueous humour as a probable cause of glaucoma, and thinks that this probably occasions the primary rise of tension, after which the advance of the root of the iris will account, mechanically, for the characteristic symptoms. HAROLD GRIMSDALE.

(5) **Delord** (Nimes) extracted, without accident, a cataract from the right eye of a man, aged 73 years, the subject of pronounced arterio-sclerosis and well-marked arcus senilis. A preliminary iridectomy was afterwards performed on the other eye, also affected with cataract. The patient was discharged on the seventh day after operation. Two months later, however, the man again presented himself with total prolapse of the iris through the wound made when iridectomy was performed. There had been no injury to the eye. The prolapse was excised, and a fortnight later the cataract was removed. In the result, vision of 1/10 was obtained, but the vitreous opacities and choroiditic foci present were enough to account for the poor sight obtained. SYDNEY STEPHENSON.

(6) The conclusions of **Tertsch's** paper, which are based on clinical material and experiments on the rabbit, are as follows:—

(1) Anterior polar cataract may form in juvenile subjects in a surprisingly short time after central perforation of the cornea; perhaps mechanical separation of the lens-fibres and detachment of the capsule are amongst its favouring causes. But similar cataract also occurs after peripheral perforation.

(2) The mode of formation and the first phases of polar cataract are commensurate with the severity of the infection and the consecutive disturbance in the nutrition of the lens. If this be considerable, as in suppurative iridocyclitis, we get an extensive degeneration with subsequent regeneration of the capsular epithelium, while in lesser uveal affections the proliferation of the epithelium may be primary.

(3) We may find scattered cortical masses included within the

area of epithelial proliferation (E. Treacher Collins). In one case the affection of the lens was merely cortical, but this may have been only a preliminary stage of consecutive polar cataract.

R. GRUBER.

(7) **Twietmeyer** (Greifswald) records three cases in which a macular hole was found as the final result of traumatism. In the first, the surgeon made a special note that there was a central scotoma for white and colours. The macula was opaque and clouded, but there was then no sign of a hole. A year later the case came to Twietmeyer's *Klinik*, and a hole, half the size of the disc, was found in the macula. Corrected V. $= \frac{5}{20}$. The second case was found to have a macular hole at the first examination, made within a week of receiving a blow on the eye. In the third case there was a corneal wound, and the fundus could not be seen at first, but within a month a hole was detected half a disc-diameter in extent

These three cases are very important, and the papers should be read in conjunction with Coats's article on the "Pathology of Macular Holes" (*Royal Lond. Ophth. Hosp. Reports*, March, 1907). Coats thinks that a macular hole following a blow on the eye is not the immediate effect of the accident, a rupture by *contre coup*, as it were, but is the result of retinal œdema. He brings evidence in support of his hypothesis, which was foreshadowed by Fuchs. Twietmayer's cases afford conclusive proof of the truth of Coats' views. The first showed very marked œdema of the retina before a hole developed. This œdema was observed to give place gradually to a typical macular hole. In the other cases the macula when first seen was surrounded by a "clouded" (trübung) retina. Twietmeyer observes that the holes were preceded by a cloudy retina, and regards the condition as often the effect of a traumatism.

A paper by Küsel—"The Cause of Central Atrophic Retinitis" (*Klinische Monatsblätter für Augenheilkunde*, November, 1906)—discusses the same subject. Küsel thinks that undue importance has been attached to the effect of œdema, and too little to vascular changes and consecutive failure of nutrition.

T. HARRISON BUTLER.

(8) **Marx** has investigated the after-history of 16 cases of acute retrobulbar neuritis and 11 cases of toxic amblyopia. His conclusions are the following.—The prognosis as regards vision in cases of unilateral acute retrobulbar neuritis with a relative central scotoma, occurring in patients *ætat.* 20—35 years, is good; the prognosis as regards general nervous complications in these cases is very serious, as disseminated sclerosis appears soon after the ocular affection in a large percentage of cases. The author found that of the 16 cases of retrobulbar neuritis, 8 regained full vision, 7 regained $\frac{6}{10}$-$\frac{6}{7.5}$, and only one case $\frac{6}{20}$. Six cases developed disseminated sclerosis. The prognosis as regards vision is good in cases of toxic amblyopia, if the patient

abstains for a time from tobacco and alcohol. There is no danger of general nervous diseases. The author gives the histories of all his cases, many of which are interesting.

PERCIVAL J. HAY.

(9) The diagnosis between erysipelas, on the one hand, and some inflammatory conditions of the lacrymal sac and skin of the eyelids, on the other, is now and then apt to be a little puzzling. **Milian** (Paris) gives three signs which he claims to be pathognomonic of erysipelas, *viz.*:—1. the sign of centrifugal maximum; 2. the ear sign; and 3. the sign of pain. 1. *The sign of centrifugal maximum.*—It is characteristic of erysipelas that the most marked lesions are always situated at a spot at some distance from the starting-point, usually on the periphery of the patch. In other words, redness and swelling are most pronounced at the margin of the inflamed area. 2. *The ear sign.*—Inflammatory processes stop short at the ear, owing to the close apposition of the skin and perichondrium. But erysipelas is essentially a dermatitis, and by reason of that very fact invades the skin of the ear as it does that of any other part. The conclusion follows that whenever the ear becomes red, shiny, and tender, in the course of an inflammatory affection of the face, we are dealing with erysipelas. 3. *Pain on Pressure.*—A patch of erysipelas is always exquisitely tender.

SYDNEY STEPHENSON.

BOOK NOTICES.

Einblicke in die Embryonale Anatomie und Entwicklung des Menschenauges, nach eigenen Präparaten dargestellt von Prof. Dr. O. Lange, mit einem Atlas von 33 Tafeln. (An outline of the Embryonal Anatomy and Development of the Human Eye according to preparations by Dr. O. LANGE.) Wiesbaden: Verlag von J. F. Bergmann, 1908. Price 22s.

The first twenty pages of Professor Lange's *Atlas* contain a sketch of the development of the eye, written, as it were, around the plates given later in the volume. The *Atlas* includes 33 plates in black and white, of which the first eleven show the earlier stages of development in the eyes of embryo chickens, rabbits, and cattle, while the remainder, twenty-two in number, are taken from human embryos. The youngest human embryo is aged about four weeks, and the plate (XII) shows very well the first development of pigment in the proximal part of the secondary optic vesicle. Other points brought out by the plate are the formation of the epithelium of the cornea from the ectoderm and the mesodermal rudiment of the substantia propria of the cornea.

SYDNEY STEPHENSON.

Diseases of the Eye. By M. Stephen Mayou, F.R.C.S., late Hunterian Professor; Assistant Surgeon and Pathologist, Central London Ophthalmic Hospital, etc. 388 pages, with 119 original illustrations and eight coloured plates. London: Henry Frowde and Hodder & Stoughton. 1908. Price 5s. net.

Mayou's *Diseases of the Eye* is one of the Oxford Medical Manuals. From the point of view of paper, printing, and general style it is the best value for 5s. which we know of among ophthalmological publications. The illustrations are nearly all original, although, perhaps, hardly of even merit. Many are microphotographs.

For review purposes, it seems necessary to divide the book into two parts: from the beginning to page 64 and from page 65 to the end. To take the latter first, this is a downright, straightforward effort to place the essentials of ophthalmology before the student and practitioner. It is dogmatic to an extreme, and contains no argument or discussion on any subject, a fact which is admitted in the preface: it is the plan of the book. If one may be allowed to point out certain parts for special approbation, the chapters on diseases of the conjunctiva and diseases of the retina seem to be the best, although hardly sufficient is said about the treatment of adult gonorrhœal ophthalmia, or about phlyctenular disease in children. By way of criticism of this part of the volume, one may point to a slip on page 229, when "Haversian canals" should presumably read "lacunæ"; to another on page 304, "cystitis" for "adenitis"; to omission of the statement that the *negative* pole is to be within the hair-follicle in electrolysis; and, although the reviewer says it with diffidence, to the complete absence of all mention of injuries to the infantile eye and orbit during birth.

The first portion of the book, up to page 64, gives the impression that it is of the nature of a patch. Whether it was added hurriedly, and without revision, to a work not originally intended to include methods of examination or elementary refraction, or whether the author has merely neglected to revise this portion, are questions which the reviewer is unable to answer. But the fact remains, that it contains ambiguities of expression and actual misstatements which must cause trouble to the junior ophthalmologists to whom the book is addressed. The author has by this time, doubtless, repented of his omission to revise the first two chapters; the reviewer, therefore, will content himself with a justification of his criticism by referring to one bad mistake—doubly bad since it occurs twice—namely, the statement that retinal images, in order to be appreciated as separate, must subtend an angle of five degrees (pages 35 and 56). In this connection it may be pointed out that on page 57

it ought to be clearly stated that Snellen's test types are here reproduced on a reduced scale, and not on one for actual use.

An appendix to the book contains an account of the Calmette reaction, a useful drug formulary, and a statement of the vision required for the public services.

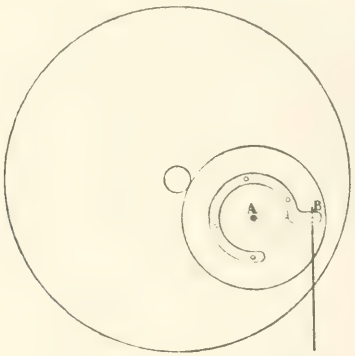
Mayou's work should have a considerable success, and, when a second edition is called for, we hope to find that the first two chapters have been brought up to the level of the rest of the book. ERNEST THOMSON.

Tuberculosis in Infancy and Childhood. By various writers. Edited by T. N. KELYNACK, M.D. London: Baillière, Tindall, and Cox, 8, Henrietta Street, Covent Garden, 1908. Price 12s. 6d. net.

This is a collection of more or less disappointing essays dealing with the pathology, prevention, and treatment of tuberculosis in infancy and childhood. It includes a short section by Mr. N. Bishop Harman on "Tuberculosis of the Eye in Children." The writer considers that, relatively speaking, tuberculous diseases of the eye are rare as compared with syphilitic diseases of the same organ. Recent work, however, would seem to render this claim somewhat more doubtful than it was thought to be only a few years ago. The author considers his subject under three heads: — (1) tuberculosis of the superficies of the eye; (2) tuberculosis of the anterior uvea; and (3) tuberculosis of the choroid. To these he adds a fourth heading on the specific and experimental diagnosis of tubercle. The dogmatic statement that most instances of tuberculous conjunctivitis are associated with lupus of the face appears open to criticism. Speaking of the relationship between phlyctenular conjunctivitis, on the one hand, and tuberculosis, on the other, Mr. Harman concludes that "the directly exciting cause is the irritation of the fifth nerve by nasal and oral sepsis in these weakened children." If this claim can be substantiated, it opens up the possibility of new and valuable avenues of treatment for an affection that now and then taxes our therapeutic resources to the utmost. Mr. Harman believes that prompt excision of the lesions of superficial tuberculous disease is in most instances the best treatment. He mentions, but without enthusiasm, the treatment of tuberculosis of the conjunctiva by means of X-rays. In his remarks about the Calmette ophthalmo-reaction, Mr. Harman's reading appears to have been of a somewhat one-sided nature, if we may judge from the fact that he quotes those observations alone that cast doubt on the diagnostic value of the reaction. Is there nothing to be said on the other side?

De la Sensibilité Cornéenne. On the Corneal Sensibility.) By LAURENT CERISE. Thèse de Paris, No. 80. Paris: G. Steinheil, 2, Rue Casimir Delavigne, 1908.

After a preliminary discussion of the nerves of the cornea and conjunctiva, and of the sensitiveness of the cornea to pain, touch, temperature, pressure, and chemical and electric agents, Cerise describes and figures a new corneal æsthesiometer. The instrument, which is about the size of an ordinary watch, is mounted on a copper base. A hair is attached exactly at right angles to the radius of a large toothed wheel, and the pressure is transmitted by means of a second smaller toothed wheel, a pinion, and a fine watch-spring to a needle on the other side of the appliance, the face of which is graduated so as to indicate pressures of 1, 2, 5, 10, 15, 30, 50, 70, 80, 100, 150, and 250



milligrammes. The diagram will convey to readers some idea of the little appliance designed by Cerise. The method of use is simple: the cross-section of the hair is applied to different parts of the cornea in succession, and the pressures required to elicit the least sense of contact are entered upon a schema of the cornea. The hair should be applied to the cornea perpendicularly, and it must not be rubbed to and fro. The observation must be discontinued the moment the eye becomes red or waters. Another point is that the hair should not be allowed to touch the eyelashes. After some practice, uniform results may be obtained by the æsthesiometer indicated rather than described above.

As regards the normal sensibility of the cornea, Cerise agrees with Kruckmann's estimate, namely, that it can be fairly represented by 1 or 2 milligrames. It becomes greater with advancing years. The author finds that a pressure of 15 or 20 milligrammes is necessary before sensation can be elicited when the instrument is applied over an arcus senilis. The sensibility is lowered after a section parallel to the limbus, such as that made for the removal of senile cataract. This is obviously due to division of the nerves. The sensibility is reduced in all

affections of the cornea, whether superficial or parenchymatous, and the reduction is so much the greater the deeper or denser the lesion. Even in the absence of all lesion, hypoæsthesia of the cornea is determined by watering of the eye and conjunctival injection. In glaucoma the corneal sensibility is lowered in proportion as the intra-ocular tension is heightened. In trophic disorders the æsthesiometer renders valuable help in the localisation of small affected areas (corneal or conjunctival) that might otherwise readily escape detection. The estimation of the corneal sensibility has a certain prognostic value, especially in ases of herpes zoster, corneal opacities, and burns by sulphuric acid. SYDNEY STEPHENSON.

Atlas of Rare Ophthalmoscopic Conditions and Supplementary Plates to the Atlas of Ophthalmoscopy. By Hofrat J. OELLER. The text translated into English by Thos. Snowball, M.A., M.B., Burnley, England. Part VI, 5 plates with text. Wiesbaden: Verlag von J. F. Bergman, 1908.

Part VI of Oeller's *Atlas* with German and English text, the latter the work of Mr. Thomas Snowball, contains five plates, namely:—1. Neuritis optica; vena cirsoides; 2. Retinitis proliferans striæformis; 3. Chorio-retinitis sclopetaria; 4. Membrana epipapillaris; and 5. Choroiditis disseminata tuberculosa. The last plate represents extensive choroiditis in almost all stages of evolution in a man of 22 years, who suffered also from posterior synechiæ and floating vitreous opacities. The sight of the affected eye was reduced to 6/20 and Nieden 1. There was dulness over the apex of one lung, and a general reaction followed the injection of tuberculin. Moreover, local reaction, shown by marked increase in the vitreous opacities, succeeded treatment of the case by tuberculin T.R. The reaction, general and local, which followed the injection of tuberculin warranted the identification of the fundus condition as being due to tuberculosis. Oeller regards the present case as a proof of the truth of Michel's theory, *i.e.*, that many cases of what seem to be ordinary disseminated choroiditis are in reality of tuberculous origin. The experimental researches of Stock prove that tubercle bacilli become deposited in the choroid and iris by way of the circulation, and give rise to inflammatory nodules in the structures named. In man these may become absorbed and leave no trace behind, or they may exhibit a pronounced tendency to heal with the formation of scars. The plate shows, in addition to a recent tuberculous deposit, several other areas in the choroid where cicatrisation is apparently complete. The plate may be compared with a case depicted in Part V of the *Atlas* (published in 1906) of solitary tubercle of the choroid in a girl of 19 years. Keratitic deposits and vitreous opacities were

present, and vision was 6/15 and Nieden 1. About a couple of disc-breadths below one papilla lay a well-defined area, composed of two confluent patches, the upper one distinctly swollen and of yellow colour, and the lower one taking the form of an oval, greyish-green vesicle. The point of interest was that eventually the mass was replaced by a flat, white, atrophic area in the choroid, differing in nowise from a large atrophic patch of ordinary disseminated choroiditis. SYDNEY STEPHENSON.

Transpositions. By R. M. LOCKWOOD. New York: Frederick Boger Publishing Company, 1, Maiden Lane. Copyright 1907. Price 25 cts. net.

This paper-backed *brochure* of 32 small pages, although designed in the first instance for "optometrists and opticians," will doubtless prove useful to many ophthalmic surgeons, especially as the subject is scarcely as much as mentioned in some of the more important text-books of ophthalmology. Who has not experienced the difficulty of explaining to a tyro in refraction work how to transpose lenses from the retinoscopy diagram to the trial-frame or the prescription card? As Lockwood points out, the transposition of lenses may be worked out by means of the familiar cross, but after this has been done and the process understood, then the change can be effected much more speedily by a rule or set of rules. The latter are set forth in the simplest possible way. We may select as an example skiascopy as worked out with spherical lenses. The rules are two in number: 1. Take the value of one of the meridians as that of the required compound corresponding lens. 2. Deduct algebraically this same value from that of the other principal meridian to get the cyclinder of the required compound, the axis to be that of the meridian first employed.

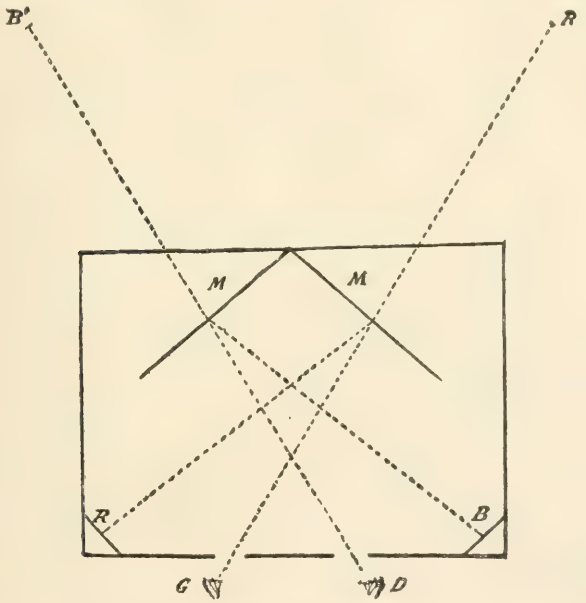
Lockwood's little book is one to be studied by the student when he first begins to work out refraction cases.

The Major Symptoms of Hysteria. By PIERRE JANET, M.D., Professor of Psychology in the College of France, etc. New York: The Macmillan Company. London: Macmillan and Co., Ltd. 1907.

Dr. Pierre Janet's *Major Symptoms of Hysteria* (fifteen lectures given in the Medical School of Harvard University) includes a section or the hysterical disorders of vision that will well repay perusal by ophthalmic surgeons.

Hysteria appears to have an analytical power in the sense that it can separate the functions of the psycho-physiological system, and this dissociation is nowhere more curious than in the case of vision. Indeed, as regards sight hysteria can effect every possible dissociation.

The greatest and the rarest dissociation, namely, that between the entire visual function and the *ensemble* of the mind, is seen to perfection in hysterical blindness of both eyes, a condition observed by Lepois as long ago as 1618. It is usually the consequence of accidents, and so belongs to the phenomena of traumatic hysteria. In such cases the pupillary reflexes are normal, and the mobility of the phenomena (if it can be evoked) is a great help in diagnosis, which is often very puzzling. On the other hand, incomplete cases into which hysteria may resolve the visual function are not, as a rule, so perplexing. The simplest of these is represented by unilateral amaurosis, which occurs without appreciable organic disturbance, and without any impairment of the elementary functions of the eye. The important reflexes are not involved. In these conditions it is no



wonder that physicians are astonished that the patient cannot see. At the same time the superficial reflexes are apt to be disturbed, as shown by the fact that the touching of the conjunctiva or the cornea with a bit of paper will not induce spasmodic closure of the eyelids. Of singular assistance in detecting the conditions are Snellen's coloured letters and Fleess's box. The former contrivance is, of course, familiar to every ophthalmic surgeon; but the latter does not appear to be so well known as it deserves to be. The patient looks through the holes G. and D. into the box, in the corners of which are fixed two coloured wafers, one red (R), and the other white (B). These objects cannot be seen

directly, owing to their situation. The subject, however, without knowing this, sees their images in two little concealed mirrors (MM), fixed at an angle of 45 degrees with the bottom of the box. These mirrors act in such a way that an object (B) seen in reality by the right eye, is cast to the left (B′) and by the left eye to the right (R′). Neither of the wafers can be seen simultaneously by the two eyes. Now, a one-eyed man when asked to look into the box would say: "I see only one wafer, the white one, B, for instance, but what astonishes me is that it appears on my left side; now, usually I am not able to see on this side." The conduct of hysterical patients varies. Most frequently they declare that they can see both wafers.

An explanation of unilateral amaurosis based on fraud has now been given up. Suggestion, subconscious sensations, and dissociation phenomena have all been evoked. Hysterical subjects mostly lose binocular vision, or they may, as in the case under discussion, lose the vision of one eye while retaining binocular vision.

A section is devoted by Janet to the concentric contraction of the visual field so often found in hysterical manifestations. The claim that such a field is present in epilepsy and disseminated sclerosis is nowadays known to be false. It is, on the contrary, one of the most important signs of hysteria. It is curious that a pronounced contraction of the field appears to be quite a matter of indifference to the hysterical patient, although, as a matter of fact, nothing is more inconvenient than a real contraction of the field, such as is met with in retinitis pigmentosa and chronic glaucoma. This is one of the finest examples of the persistence of sub-conscious sensations in hysteria. Janet relates the following instructive case.—A boy suffered from violent crises of terror caused by a fire, and it was enongh to show him a small flame to induce such a fit. His visual field was reduced to 5 degrees. But a fit could be provoked by making him fix his eyes on the central point of the perimeter and then approaching a lighted match to the eightieth degree!

Authentic instances are known of hysterical hemianopsia.

It often happens that hysterical patients, while still retaining good visual acuity, cease to perceive certain colours, especially, so it is said, violet, blue, and green. Red appears to be the more persistent colour, a fact formerly considered to account for the fondness of hysterical subjects for red. Janet advises caution in the interpretation of even carefully mapped-out fields of colour, since there are fallacies due to the illumination, and the influence of the association of ideas plays a great part in the perception of colour.

Lastly, Janet considers hysterical ophthalmoplegia, spasm of accommodation, diplopia, macropsia, and micropsia.

SYDNEY STEPHENSON.

Second International Congress on School Hygiene, London, 1907. Patron: His Most Gracious Majesty the King. Transactions. Price 5s. each volume; complete in three volumes 12s. 6d., bound 15s. net.

From August 5th to 10th, 1907, the Second International Congress on School Hygiene, assembled in London, and attended by members and delegates from nearly every civilised country, was engaged in considering, from a hygienic standpoint, the life of the child attending school. Of the many interesting papers and discussions, those only which relate to the eye can be noticed, and that very briefly, in THE OPHTHALMOSCOPE.

The hygiene of the healthy eye was considered, practically, only in relation to eye-strain. In several ways, it was shown, this might be reduced or avoided. The immediate succession of studies requiring near vision must be forbidden. They should be separated by work in which accommodation would be comparatively relaxed (a). It was stated that foreign languages tried the eye more than the child's native tongue (a). Children in class should be seated according to their visual power—myopes in front, and so on.

The illumination of class-rooms (b) very properly received a large amount of attention. No set of rules universally applicable was possible, owing to the very different conditions obtaining as to countries, climates, positions, and so on. One standing rule, however, was essential: a sufficient, steady, diffuse, and uniform light must be provided for all the seats (b).

As to *aspect*, a wide difference of opinion was shown to exist; but, on the whole, aspects ranging from N.E. through N. to N.W. were to be preferred. Direct sunlight falling into the class-room was, in spite of its cheerful influence and germ-destroying power, found to be attended with many disadvantages.

Windows should never face the children, but their best position was not settled. In France, it was stated, windows above were forbidden, and a position behind the child was objectionable. A supply of light from the left was recognised as best. One authority said this should be the only supply, but in the discussion it was claimed that a bilateral supply was best, because windows right and left allowed of the best ventilation. In England the claim of the teacher has been recognised in the provision of a window for his special benefit.

The ratio of window-area to floor-area was found to be an unsettled point. In certain schools in America these areas are made equal, but one to five seemed best. Too great window-area should not be permitted. The lower line of the windows should not be above 4 feet from the floor, and the upper lines should, as nearly as possible, reach the ceiling. Both children and teacher should have a view of the sky. By means of an apparatus with the musical name of *Raumwinkelmesser* (b),

the stereo-angle of the sky might be obtained, and the amount of light supplied to each seat estimated. A good deal of attention was, indeed, given to photometry. The ceilings of the classroom should be white, the walls grey or light-green, and bright reflecting angles or glare should not be allowed.

Artificial light, although said to be not much required at the present time, should, when necessary, be arranged so as to imitate daylight in being steady, uniform, and diffuse, and should illuminate each seat equally. Electricity should, wherever possible, be used, modified, if necessary, by screens, etc. The grouping of electric lamps in electroliers was condemned ; and the best, although most costly, supply was obtainable from inverted arc-lights reflected from the ceiling.

Errors of refraction (c), and especially the increase of myopia with length of schooling, received attention, but nothing of special value as a remedy appears to have been suggested.

In Glasgow, 35 per cent. of the poorer children were found to have defective vision (c), some of which was only functional, and the defects were greatest amongst those badly fed, or living in the most densely populated quarters. In Blackpool, of 2,279 children tested, 23 per cent. were defective in vision (c). At Rugby School, among 1,000 newcomers the following defects were found (c): H. 40 ; M, 128 ; astigmatism, 27 ; colour-blindness, 12 ; and congenital cataract, 1.

Disease of the Eyes.—Little attention appears to have been paid to any disease other than trachoma and ophthalmia neonatorum. In the case of diphtheria epidemics, the number of eyes affected, if any, does not seem to have been noted, and the influence of measles on the eye is also passed over. In New York City (d) for six months, treatment of trachoma in children still attending school was tried, and the experiment found to be successful, except that children after operation or treatment too frequently became re-infected through sitting beside others who were not being treated. A census in 1902 revealed the presence in all the schools of 17,000 cases of trachoma, the largeness of the number being, perhaps, explained by the fact, elsewhere stated, that in America all cases of follicular conjunctivitis are classed as trachoma.

"*Trachoma in London Schools*" (d) starts with the warning, "epidemics of trachoma are by no means out of the question in this country," and points out a defect in the Education Act, which having ordered the exclusion of all cases of trachoma from the schools, abandons the sufferers to fate. The difficulty of diagnosing quite early cases from follicular conjunctivitis is recognised ; but the presence of greyish-white specks, not raised above the surface, is said to be characteristic, as these develop later into trachoma bodies. In a case of deliberate exposure the specks appeared in four weeks, and the case required nine months for cure, although immediate treatment by "expression" and perchloride of mercury was adopted.

Blindness is very fully considered. The characteristics of mind in blindness, due to various causes, is dealt with (e), the classification being : (1) accidents, including purulent ophthalmia ; (2) general or inherited disease ; (3) congenital deformities ; (4) disease of the eye alone, including myopia. In the ensuing discussion, retinitis pigmentosa in deaf mutes was mentioned, and it was advised that in these, and other partially blind cases which are progressing, finger or sign, rather than lip, language should be taught until the use of the Braille system is indicated.

Special hygiene for the blind (e) is said to be necessary, especially among the poor, and an elementary handbook for their instruction is demanded. Workrooms, etc., for this class are said to be often shamefully lighted, under the mistaken idea that for these sufferers light is not necessary. Crèches for the quite young are advised, and gymnastics for those who are older should replace games in which the blind cannot join.

For the sad class of feeble-minded blind children (e), a special institution is recommended in London, where there are cases numerous enough to justify its existence. For the teaching of these, the child's sense of touch is considered the best means, and a case showing great musical talent is stated to have been thus discovered.

Those who cannot find their way in daylight or count fingers at 12 inches may be considered blind (e). In 1902, over 25,000 such cases were known in England and Wales. A universal scale for degrees of blindness is required, and the following is suggested : (1) fair light vision, 6/12 ; (2) weak light vision, 6/18 to 6/24 ; (3) bad light or partially blind vision, 6/36 to 6/60 ; (4) blind, 1/60 or less. At least half-a-million people in England are said to have defective vision. As to ophthalmia neonatorum, 4 per cent. still lose the sight in spite of early treatment. Nurses and midwives should be compelled, as in America, to give immediate notice of the slightest inflammation or discharge, under penalty of a heavy fine or even of imprisonment. Appeals have been made to the Registrar-General to have issued cards of instruction for all cases of birth registered ; but it appears that the local registrars are " not paid " for undertaking such a duty.

REFERENCES.

Lighting.

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(b) **Courtois, M. Georges and Dinet, Dr. Robert.**—*Same Subjects.*
(b) **Prausnitz, Dr. Wilhelm.**—*Same Subjects.*
(b) **Pleier, Dr. Franz.**—*Stereo-angle of Skylight.*
(b) **Ruzicka, Dr. Stanislav.**—*Provision of Daylight for every School Place.*
(b) **Selter, Dr. Med.**—*Measurement of Daylight in Schools.*
(b) **Quirsfeld, Dr. Ed.**—*Photometric Studies in Schools.*

ERRORS OF REFRACTION.

(c) **Thomson, Dr. H. Wright.**—*Eyesight of the Poorer City Children.*

(c) **Janele, Jos and Moucha, Cen.**—*Method of Medical and Hygienic Examination in Schools.*

(c) **Greenwood, Dr. Alfred.**—*Medical Inspection of School Children.*

(c) **Dukes, Dr.**—*Record of the Physical Examination of* 1,000 *Boys at their Entrance on Public School Life.*

(c) **Prausnitz, Dr. Wilhelm.**—*Lighting and Ventilation.*

DISEASE.

(d) **Cronin, Dr. John J.** (New York City).—*Medical Treatment at School.*

(d) **Tyrrell, Mr. F. A. C.**—*Trachoma in London Schools.*

BLINDNESS.

(e) **Harman, Mr. Bishop.**—*Mental Characteristics Associated with Blindness of various Causation and their Relation to Training.*

(e) **Hill, the Rev. St. Claire.**—*The Present Necessity for Attending to the General and Special Hygiene of the Blind.*

(e) **Wilson, Henry J.**—*The Feeble-Minded Blind*

(e) **Bronner, Dr. Adolph.**—*Definition of Blindness in Children: its Causes and Prevention.*

CORRESPONDENCE.

SOME RECENT BRITISH WORK ON STANDARDISATION.

To the Editors of THE OPHTHALMOSCOPE.

Gentlemen,

The review by Mr. W. A. Dixey, in the September OPHTHALMOSCOPE, of the work of standardisation done by the Optical Society, refers to the disadvantage of using the word "dioptre" to indicate the prism unit. It has seemed to me that the "centrad" (the angle subtended by 1/100 of the radius, measured on the arc) was the best unit for the deviating power of prisms. It is, of course, a little more difficult to prepare a scale for deviation in centrads, since we have to use the natural tangents in laying off the tangent scale, in place of simple centimeters. But any number of centrads is an exact multiple of one centrad, and this is not true of angles indicated by prism dioptres;

although the prism dioptre and the centrad are practically equivalent for the prisms commonly prescribed, and either of them a little greater than the minimum deviation produced by a prism having 1 degree refracting angle. The name centrad suggested by Dr. W. S. Dennet to indicate the angle measured by 1/100 of the radius on the arc, is one not easily confused with any other term used in connection with the prescription of glasses.

With regard to the neutralisation of lenses, the solution is to be found in the use of plano-concave and plano-convex spherical lenses, at least the stronger lenses for which neutralisation presents difficulties. The whole obstacle is the thickness of glass-separating surfaces that are expected to neutralise each other. This difficulty disappears absolutely when plano-lenses are used. They can be employed to neutralise plano-lenses, and equally well (by using two) to neutralise bi-convex or bi-concave, periscopic, or toric lenses. The neutralising surfaces are in exact contact, no matter what the size or thickness of the lens may be. If any such plan as that suggested in the Committee's report were adopted, as 19 D. bi-convex neutralised by 20 D. bi-concave, the standard can only be good for a certain thickness, and therefore for a certain size of lens. It is inaccurate for plano-lenses, or for periscopic or toric, or for all sphero-cylindrical combinations. I have used trial sets of plano-convex and plano-concave spherical lenses for more than twenty years. And, in view of their convenience and accuracy, any other method of standardisation for purposes of neutralisation looks absolutely stupid. The bulk of trial sets now in use contain the bi-convex and bi-concave sphericals, but a single plano-spherical lens of each strength from 8 D. upward would be all that would be necessary for practical work. With lenses weaker than 8 D. the difference is not sufficient to cause any notable error. The plano-cylinders we already have in all trial sets. Yours, etc.,

EDWARD JACKSON, M.D.

Denver, U.S.A.

To the Editors of THE OPHTHALMOSCOPE.

Sirs,

I am obliged to you for letting me see Dr. Edward Jackson's letter, which contains two interesting suggestions with reference to standards.

A proposal to adopt the plano-spherical form for test lenses was indeed before the Standards Committee. It was forcibly advocated, and I do not think that any of the advantages alluded to in Dr. Jackson's letter were overlooked. But there was an overwhelming weight of opinion in favour of the bi-spherical form. The neutralising advantage of the plano-lens is obvious,

but there are other difficulties. There is considerable difference between the front and back focal lengths; and the question arises from what point, and in which direction the focal length shall be measured. Thickness tells, and it may be remarked that even with a plane surface, incident, convergent, or divergent light is affected as to focal length by the thickness of the glass. Perhaps what chiefly influenced the Committee in favour of the bi-spherical form was the fact, noted by Dr. Jackson, that the bulk of existing trial sets are so fitted. It was felt that a recommendation involving so universal a condemnation would only be justified by very clear and decisive advantages.

With regard to the other suggestion, Dr. Edward Jackson's dislike of the prism dioptre is shared by me personally, although not, I fear, by the majority of my fellow tradesmen. But it is difficult to see the advantage of his suggested notation. There would seem to be no reason for taking the hundredth part of the radius, except to give the notation an entirely unnecessary decimal appearance. And in any case, as the tangent values must always be referred to a table of degrees, it would seem unnecessary to go beyond the universally accepted degree as the unit for the deviating power of a prism. I believe it was Dr. Edward Jackson, who some thirty years ago was the first publicly to propose the measurement of prisms on this basis. It would be interesting to know what induced him to substitute the "centrad" for the degree. Perhaps it was for some reason that escapes me.

I am, Sirs,

Yours etc.,

London, W. W. A. DIXEY.

NOTES AND ECHOES.

Deaths.

THE death is announced of A. Krükow, professor of ophthalmology in the University of Moscow, at the age of 59 years. The deceased, who was vice-president of the Ophthalmological Society, occupied a prominent position among Russian ophthalmologists. Krükow had edited, since 1904, the *Westnik Ophthalmologii*, the only Russian ophthalmolgical periodical. John Briscoe, F.R.C.S., whose death is announced at the advanced age of 88 years, has left a large sum to the Radcliffe Infirmary, at Oxford, an institution of which he was surgeon for many years. He belonged to the older order of practitioners, who combined ophthalmic with general surgery.

He had, however, retired from the active work of his profession for several years before his death. Ernest A. Crockett, ophthalmic surgeon to the Central Maine General Hospital, has recently died at the age of 37 years. John R. Hamill, professor of ophthalmology in the Chicago Clinical School, died in Guthrie, Oklahoma, U.S.A., aged 44 years. Much sympathy will be felt by the readers of THE OPHTHALMOSCOPE for Professor R. Deutschmann, of Hamburg, who has lost his devoted and deeply-loved wife. Madame Deutschmann's was a charming personality.

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Appointments. CONGRATULATIONS to our distinguished correspondent, Col. H. Herbert, late I.M.S., F.R.C.S., who has been appointed honorary surgeon to the Midland Eye Infirmary, at Nottingham, in place of E. C. Kingdon, who has resigned. Edward D. Hancock has been appointed honorary surgeon to the Bath Eye Infirmary. Dr. Jane Robertson has been appointed house-surgeon to the Glasgow Ophthalmic Institution, *vice* Robertson Kerr, resigned. Dr. Wendell Reber, of Philadelphia, has been nominated as delegate from the Medical Society of the State of Pennsylvania to the American Medical Association. Professor Nagel, director of the Physiological Institute in Berlin, has accepted the professorship of physiology in Rostock. Dr. D. Manuel Marquez, for many years connected with the *Archives d'Ophtalmologie* (Paris), has been appointed professor of therapeutics in the Faculty of Medicine of the Central University of Madrid. Dr. M. de Vries has been recognised as *privat-dozent* of ophthalmology in Amsterdam, Dr. Wernike in Odessa, and Dr. A. de Lieto-Vollaro in Parma. von Sicherer has been appointed extraordinary professor of ophthalmology in Munich.

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Mr. Pridgin Teale. ON October 2nd a portrait of Mr. Pridgin Teale, F.R.S., the work of Mr. W. W. Ouless, R.A., was presented to the Leeds Infirmary, an institution with which Mr. Teale's association has been both lengthened and close. Many friends and subscribers attended the formal presentation of the painting, and Mr. Teale was also present.

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The Honours List. CONGRATULATIONS to Sir George Anderson Critchett, C.V.O., F.R.C.S., Edin., whose name figured in the recent (November 9th) list of Birthday Honours. His Majesty has conferred upon Sir

Anderson a baronetcy of the United Kingdom. The appointment will be a popular one among the medical profession in general and among ophthalmic surgeons in particular. We give a portrait of the new baronet, who is consulting ophthalmic

surgeon to St. Mary's Hospital, London. Another popular appointment is that of Jonathan Hutchinson, upon whom the King has been pleased to confer a knighthood. This distinguished surgeon was president of the Royal College of Surgeons of England in 1889-1890. His contributions to scientific ophthalmology are known the world over. The honour of knighthood, although perhaps a little belated, is richly deserved.

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The Alvarenga Prize.

THE Alvarenga Prize of the College of Physicians of Philadelphia, which amounts to the sum of about $180 yearly, has been awarded for 1908 to Dr. William T. Shoemaker, of Philadelphia, for his essay on "Retinitis pigmentosa, with an analysis of seventeen cases occurring in Deaf-Mutes, including laboratory examinations of the blood and urine in eleven cases."

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International Ophthalmoligical Congress.

IT IS announced that notice of scientific instruments and apparatus intended for exhibition at the International Ophthalmological Congress, which is to be held at Naples from April 2nd to April 7th, 1909, should be sent at once to the President, Professor Arnaldo Angelucci, S. Andrea della Dame, Naples, Italy. Communications intended to be read at the Congress should reach the President not later than December 15th, 1908.

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Alien Trachoma.

A MAN named Dovsky has been recently sentenced at the Liverpool Police Court for having tried to bribe the surgeon of the White Star Liner "Cymric" as an inducement to pass certain immigrants who were suffering from trachoma. The prisoner was recommended for deportation under the Aliens Act.

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Trachoma Prize.

READERS are reminded that essays in competition for the prize of 1,000 crowns, offered by the Imperial Hungarian Minister of the Interior, must reach Belügyministerium, 1, Vár, Budapest, on or before December 31st, 1908. The official languages are Hungarian, German, French, or English. Printed work will be received, provided it has been published for the first time during the years 1907 or 1908. The decision of the Jury, selected by the Minister, will be announced in September, 1909, during the meeting of the XVI International Congress of Medicine.

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The regulation of the sale of spectacles.

THAT useful body, the *Syndicat général des Oculistes Français*, as we gather from a recent number of our contemporary *L'Ophtalmologie Provinciale*, have come to some far-reaching conclusions with regard to the unorthodox provision of

spectacles. They have decided to demand the following additions to the Medical Act of 1892: 1. that any person not a doctor of medicine shall be deemed to act illegally if he prescribes spectacles, whether spherical, cylindrical, or sphero-cylindrical, by any method whatsoever of examining refraction; and 2, that any optician who sells spectacles to a patient not provided with a medical prescription shall be deemed to exercise medicine illegally. These recommendations are all very well from a medical point of view, but the last especially strikes one as being outside the pale of practical politics, more particularly in a democratic country such as France.

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General Booth's eyes.

It is announced in the public press that an operation for cataract will be performed on General Booth, the veteran Salvationist, after the aged General's return from Germany, by a well-known Nottingham ophthalmic surgeon.